

# **MARKSCHEME**

**November 2007**

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

**Higher Level**

**Paper 2**

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**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 15.*

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

2. (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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***Please see generic markband information sheet on page 15.***



**Area of impact: Politics and government/Education**

3. (a) **Identify *two* advantages of using solid-state secondary storage in the \$ 100 laptops instead of a conventional hard disk.** **[2 marks]**

Answers may include:

- less likely to break/no moving parts
- faster access to stored data
- lighter in weight
- smaller in size
- solid state secondary storage may work in extreme climates and environments where hard disks might fail
- lower power consumption
- less heat dissipation – can do away with large cooling fans, internal power supply
- longer life span.

*DO NOT accept cost as a solid-state is more expensive.*

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

- (b) **Describe *two* language-related problems that must be solved in the development of the \$ 100 laptops in order to make them usable in different countries.** **[4 marks]**

Answers may include:

- keyboards displaying local characters in the local language
- applications/software to show appropriate characters in the local language
- the operating system/menu items are in the local language
- help/instruction documents/helpdesk in the local language
- literacy levels – users may not be able to read/write in their own language – GUI interface/non character based interface would solve this
- users may not be able to read information on the Internet as it is in English – install website language translation software for the local language.

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*[1 mark] each for each language-related problem 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 the reasoning behind the decision to use open source software on the \$ 100 laptops instead of commercial software.** **[4 marks]**

Answers may include:

- available for free, cheaper than commercial software licenses
- source code can be adapted to specific situations and freely distributed locally
- there is no single company on which the support for the software depends
- errors/bugs fixed quickly by many people working globally
- less prone to attack by viruses – majority of viruses are targeted at commercial software.

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**[1 mark]**

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

**[2-3 marks]**

*A reasonable explanation of the decision to use open source instead of commercial software, 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 of the decision to use open source compared with commercial software.*

- (d) **Discuss why governments in developing countries would want to distribute the \$ 100 laptops to every child.**

*[10 marks]*

Answers may include:

- provides equal access for all children to information – \$ 100 laptops would have Internet access and provide access to information and resources where books and other resources are not possible
- children who cannot attend school may have the opportunity to learn at home
- makes children aware of developments in other parts of the world – children can stay abreast of current events where access to other information sources may not be available
- children can become involved in global projects – projects with children in other countries, online expeditions, contact with experts
- engages families in the use of technology – children bring the laptop between home and school and involves the family in learning environment/entertainment
- Internet/email access provides a method of communication which could be used by the children/families to keep in touch
- provides the opportunity to access online books and publications for free instead of having to spend money buying books
- the laptop is a tool for learning – reading, mathematics and other subjects
- economic advantages for the country – resulting from a more IT aware population
- to gain votes/increase popularity.

*Please see generic markband information sheet on page 15.*

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**Area of Impact: Arts, entertainment and leisure / Health**

- 4 (a) Identify *two* ways that individuals can make a payment in order to play online digital games. [2 marks]**

Answers may include:

- prepayment system *e.g.* Paypal
- credit card
- EFTPOS/debit card
- access card
- through a third party
- cheque sent to Head Office
- payments by SMS
- direct debit from account each month.

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

*Do not accept brand name alone (e.g. Paypal) without an indication of the type of system.*

- (b) **MMOGs involve high quality sound, high resolution graphics, quick-moving animation and video. Describe the specifications of a home computer system that would provide the player with the best game playing enjoyment.**

[4 marks]

Answers may include:

- specification: high speed processor/high clock speed – any comment about refresh rates/smooth movement/quality sound.
- specification: hardware to display high resolution graphics (*e.g.* high resolution monitor, high resolution graphics card) – comment about quality required of the images/display characteristics.
- specification: large amount of memory – to allow the quick-moving animation to play smoothly/reduces disk access delays.
- specification: specialised input devices (*e.g.* game pads, steering wheels) – to allow quick/specialised responses from the player.
- specification: broadband – in order to download large quantities of data such as high resolution graphics, animations, video, multiplayer information to allow real time playing.
- specification: high quality sound card/speakers/headset – to enhance the audio of the game.

*[1 mark] each for each specification 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 MMOGs demonstrate that digital information can have economic value.**

[4 marks]

Answers may include:

- players sell virtual artefacts that they have collected in the online game to other players who want advantages in the game
- players sell their virtual characters through online auctions to other players who want quick success through a character with particular characteristics
- some websites sell information that will give the players advantages in the game (*e.g.* cheat sheets, advice on how to perform better)
- persons who particularly enjoy the online games continue to pay high fees each month in order to play the game
- young games (in China) work in digital “sweatshops” paid by affluent gamers to increase their playing levels
- companies pay game makers to place their advertisements in online games.

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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 MMOGs demonstrate that digital information can have economic value, 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 MMOGs demonstrate that digital information can have economic value.*

**(d) Discuss the possible consequences that online games have on players. [10 marks]**

Answers may include:

**Negative**

- addiction – consequences of addiction, solutions to addiction
- isolation from friends and family – only contact with other players through social networking areas of the MMOG
- affect on their job or work – students not doing their homework, employees losing their jobs by playing during work hours or not functioning on the job
- financial burden – monthly obligation to pay the fees, involvement in acquiring artefacts and characters
- difficulties in differentiating between the MMOG and real life – acting out the scenario of the online game in real life, criminal acts being committed such as shootings
- health issues that can be directly contributed to excessive online game playing – RSI problems with fingers, wrists and arms; eye problems, pains in back and neck; headaches
- monetary loss through theft of virtual items
- digital “sweatshops” (see above)
- player’s computer is vulnerable to viruses/hacking
- *other health issues (Do not accept obesity unless a reason is given for gamers having the condition).*

**Positive**

- fun/entertainment – these games provide a rich experience with action/control over characters
- communication – games allow interaction with other game players/ social networking
- time and money saved as do not have to travel to enjoy games
- escapism – relief from mundane activities
- economic gain due to buying and selling virtual artefacts
- improved problem solving skills
- improved hand-eye coordination.

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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>Description</b>	<i>3-5 marks</i>	<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>Examination or Analysis</b>	<i>6-8 marks</i>	<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>Opinion (discuss, evaluate, justify, recommend and to what extent)</b>	<i>9-10 marks</i>	<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>

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