

MARKSCHEME

May 2004

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 *four* actions of office workers that can be monitored using software.** **[4 marks]**

Award [1 mark] for each action identified up to a maximum of [4 marks].

- work-related programs accessed (e.g. WP, DB, Internet etc)
- non-work related programs accessed (e.g. games)
- keystrokes of office workers
- answers relating to time logged on
- view the e-mail correspondence which was sent and received
- websites visited
- files accessed
- downloading files or software
- uploading files.

Do not accept viewing users screen (NAQ).

Reward other acceptable answers only with the approval of the team leader.

- (b) **Explain *three* reasons used by employers to justify why employees should be monitored.** **[6 marks]**

Award [2 marks] for each reason fully explained up to a maximum of [6 marks].

Award [1 mark] for each partial explanation.

- to increase efficiency by ensuring time allocated to each task is appropriate
- to increase efficiency by discouraging the use of company computers (or time) for private / undesirable activities
- to prevent corporate espionage
- to prevent corporate sabotage
- reduce chances of data corruption (e.g. virus)
- to provide assistance from technical support staff.

Do not accept “These belong to the company, so we have the right”.

Reward other acceptable answers only with the approval of the team leader.

- (c) **Discuss *three* ethical *and/or* social considerations associated with office worker monitoring. Evaluate your arguments.** **[10 marks]**

Award up to [3 marks] for each consideration fully discussed.

Award only [1 mark] if each consideration is only stated.

Award up to [3 marks] for evaluation.

There could be a maximum [12 marks] indicated, but the maximum you may award is [10 marks] (i.e. if there are 10, 11 or 12 ticks mark awarded is 10).

- a policy must be formulated about when, where and why monitoring will take place
- office workers must be informed of any policy relating to monitoring
- office workers must be made aware when they are being monitored
- possible punitive actions must be known
- low morale could result from the monitoring of office workers
- who will monitor and have access to the information?
- how is the security of stored data ensured?
- issues relating to loss of morale (e.g. extent of monitoring)
- the need for a clear and agreed policy (who, what, when)
- invasion of privacy plus valid example (without example is no marks)
- economic cost to company of monitoring process.

Reward other acceptable answers only with the approval of the team leader.

SECTION B

Area of Impact: Education

2. (a) **Identify *two* different information sources that are available to libraries by subscription on the Internet.** [2 marks]

Award [1 mark] for each information source identified up to a maximum of [2 marks].

- subscriptions to particular news sources such as online newspapers
- specialized online databases (e.g. SIRS library system)
- online encyclopaedias
- online commercial information sites (e.g. results of product tests/best buys)
- online image galleries.

Reward other acceptable answers only with the approval of the team leader.

- (b) **Describe *two* problems associated with students' over reliance on Internet sources for research.** [4 marks]

Award [2 marks] for each problem fully described up to a maximum of [4 marks].

Award only [1 mark] for a partial description.

- particular search engines have biases and return listing based on those biases
- necessary background information from paper resources (newspapers, magazines) will not have been used
- reliability of information on Internet sites needs to be verified.

Do not accept plagiarism (NAQ).

Reward other acceptable answers only with the approval of the team leader.

- (c) **Describe *two* reasons why individuals would make requests to libraries rather than find the information for themselves through Internet sources.** [4 marks]

Award up to [2 marks] for each reason fully described up to a maximum of [4 marks].

Award only [1 mark] for a partial description.

- librarians have the expertise to search efficiently for specific information
- libraries have access to resources through their contacts and subscriptions which are not available to persons from home
- saves time involved in searching oneself
- libraries will only use reliable sources, so information is more likely to be valid
- easier if researcher is disabled or cannot use Internet.

Reward other acceptable answers only with the approval of the team leader.

- (d) **Discuss *three* ethical *and/or* social impacts on public libraries, that result from an increased demand for assistance in finding information. Evaluate your arguments.** **[10 marks]**

Award up to [3 marks] for each issue fully discussed.

Award only [1 mark] if each issue is only stated.

Award up to [3 marks] for evaluation.

There could be a maximum [12 marks] indicated, but the maximum you may award is [10 marks] (i.e. if there are 10, 11 or 12 ticks mark awarded is 10).

- employment trends: increased demand for teleworkers in library services
- professional development: librarians need to be trained in IT. Continuing professional development is needed to keep up to date with IT developments and to further develop skills in information retrieval
- librarians must be responsible in thoroughly verifying information before responding
- financial implications: increased expense in the hardware and software resources of libraries including extra subscriptions. Increased number of teleworkers.

Reward other acceptable answers only with the approval of the team leader.

Area of Impact: Health

3. (a) **Identify *two* different files that would be part of this relational database.** **[2 marks]**

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

- patient
- illnesses
- drugs
- DNA.

Reward other acceptable answers only with the approval of the team leader.

- (b) **Describe *two* reasons why the database must be relational in this situation.** **[4 marks]**

Award [2 marks] for each reason fully described up to a maximum of [4 marks].

Award only [1 mark] for a partial description.

- data redundancy **[1 mark]** + why redundancy is a problem **[1 mark]**
- data integrity **[1 mark]** + why a relational DB preserves integrity
- data storage capacity + how a relational DB minimizes this
- ease of data updating + why a relational DB helps.

Reward other acceptable answers only with the approval of the team leader.

- (c) **Explain *two* health advantages that will result from this program.** **[4 marks]**

Award [2 marks] for each advantage fully explained.

Award [1 mark] for each partial explanation.

- drugs can be customized to suit the genetic make-up of a patient
- reduction of drug side effects through monitoring
- people at risk of serious illness can be identified early
- improved research which can lead to a better understanding of health problems (e.g. family, environmental or ethnic influences).

Reward other acceptable answers only with the approval of the team leader.

N.B. Advantages must relate to health.

- (d) **Discuss *two* concerns arising from the project. Evaluate the importance of each one.** **[10 marks]**

Award up to [3 marks] for each concern fully discussed.

Award only [1 mark] if each concern is only stated.

Award up to [3 marks] for evaluation.

There could be a maximum [12 marks] indicated, but the maximum you may award is [10 marks] (i.e. if there are 10, 11 or 12 ticks mark awarded is 10).

- privacy of individuals could be in danger unless strict security measures are in place.
- patients' lives could be at risk if integrity of data is not guaranteed. Who has write access; who updates the patient records?
- psychological impact if the data is disclosed (to employer, family, insurer, ...)
- psychological impact on the person of knowing likelihood of life threatening disease or other health problem.

Reward other acceptable answers only with the approval of the team leader.

N.B. Concerns must relate to the scenario set (health research project).

Area of Impact: Arts, Entertainment and Leisure

4. (a) **Identify *two* software technologies necessary for sharing or using music files.** **[2 marks]**

Award [1 mark] for each information technology identified up to a maximum of [2 marks].

- software to convert WAV to MP3 or other digital music format or compression software
 - P2P client software installed on the computer in order to share files
 - standard media player (specific examples may be stated e.g. Windows media player).
- Do not accept** product / company names only (e.g. Winamp, Napster).

Reward other acceptable answers only with the approval of the team leader.

- (b) **Describe *one* alternative information technology, other than P2P, that could be used for sharing commercial music files and evaluate the ethics of the method.** **[4 marks]**

Award [2 marks] for one alternative information technology fully described.

Award only [1 mark] for a partial description.

Award up to [2 marks] for discussion of the ethics of the method.

- copying a music CD for sharing, illegal method for sharing
- downloading a music file from a server, illegal for copyrighted material
- using a legal membership service on the Internet, valid method for acquiring music files.

Reward other acceptable methods only with the approval of the team leader.

- (c) **Describe *two* advantages to the artist of having their music available using P2P technology.** **[4 marks]**

Award [2 marks] for each advantage fully described up to a maximum of [4 marks].

Award [1 mark] for only a partial description.

- easy way for an artist to become known
- encourages artistic freedom beyond what music companies allow
- facilitates collaboration between music artists
- allows an artist to market their own work
- allows recognized artist to boost sales of albums by making one sample track available.

Reward other acceptable answers only with the approval of the team leader.

- (d) **Discuss *three* social *and/or* ethical disadvantages involved with the distribution of music files using P2P technologies. Evaluate your arguments.**

[10 marks]

Award up to [3 marks] for each disadvantage fully discussed.

Award only [1 mark] if each disadvantage is only stated.

Award up to [3 marks] for evaluation.

There could be a maximum [12 marks] indicated, but the maximum you may award is [10 marks] (i.e. if there are 10, 11 or 12 ticks mark awarded is 10).

- loss of money to record companies, artists and music retailers
- artist intellectual property rights are violated
- artist may become disenchanted and leave the profession
- legal action will be taken against providers of illegal sharing of music files
- lack of control of illegal distribution of music files can lead to excessive violation.
- files maybe infected with virus (malicious or accidental)
- file may not be the one stated or expected / wrongly attributed
- file may contain spyware (tracking, cookies, etc.).

Reward other acceptable answers only with the approval of the team leader.

Area of Impact: Science and the Environment

5. (a) **Identify *two* pieces of information needed by a computer model to forecast tomorrow’s weather.** [2 marks]

Award [1 mark] for each piece of information identified up to a maximum of [2 marks].

- atmospheric pressure
- temperature
- wind speed
- rainfall
- wind direction
- cloud type / formation

Do not accept “current conditions”, “season” or other such vague answers.

Reward other acceptable answers only with the approval of the team leader.

- (b) **Describe *two* advantages of using computers to predict the weather.** [4 marks]

Award [2 marks] for each advantage fully described up to a maximum of [4 marks].

Award [1 mark] for a partial description.

- speed of processing large amounts of data
- storage capacity of large amounts of data
- accuracy of results
- ability to vary parameters easily.

Reward other acceptable answers only with the approval of the team leader.

N.B. If candidate discusses “large amount of data” without mentioning accuracy, speed or storage, award [1 mark] only.

- (c) **Describe *two* reasons why it is impossible for a computer model to predict the weather with total accuracy.** [4 marks]

Award [2 marks] for each reason fully described up to a maximum of [4 marks].

Award [1 mark] for a partial description.

- factors controlling weather are not fully understood by meteorologists
- measuring devices do not always produce reliable data
- models are necessarily a simplified approximation of reality
- (1 mark only) number of variables is too large.

Reward other acceptable answers only with the approval of the team leader.

- (d) **Discuss *three* issues related to providing weather forecasts to the community. Evaluate your arguments.** **[10 marks]**

Award up to [3 marks] for each issue fully discussed.

Award only [1 mark] if each issue is only stated.

Award up to [3 marks] for evaluation.

There could be a maximum [12 marks] indicated, but the maximum you may award is [10 marks] (i.e. if there are 10, 11 or 12 ticks mark awarded is 10).

- issues relating to economic gain from accurate forecasting (e.g. crop planting, tourism, sport)
- issues relating to economic losses from inaccurate forecasting (e.g. flooding, emergency precautions, etc.)
- issues relating to safety (e.g. aviation, mountaineering, fishing)
- legal issues: who is responsible? (e.g. losses due to flooding not forecast)

Reward other acceptable answers only with the approval of the team leader.

N.B. It is possible that candidates will cover more than one issue in each part answer. For example, in a discussion of the failure to predict flooding, they may pick up (say) **[2 marks]** on the safety issue and another **[2 marks]** on the economic issue.

Area of Impact: Politics and Government

6. (a) **Outline *two* sources that can provide this information.** **[2 marks]**

Award [1 mark] for each source outlined up to a maximum of [2 marks].

- visa applications
- passport details
- hotel registration forms
- bank/bureau de change exchange forms
- airline tickets and other travel documents such as travel insurance
- police registration, needed in some countries.

Do not accept vague answers like “immigration”, “customs”, etc.

Reward other acceptable answers only with the approval of the team leader.

- (b) **Describe *two* reasons given by governments for collecting personal information.** **[4 marks]**

Award [2 marks] for each reason fully described up to a maximum of [4 marks].

Award only [1 mark] for a partial description.

- to have identification information in case of emergency or accident
- security concerns about potentially dangerous visitors (terrorists / criminals)
- to provide statistical data for tourism research purposes
- to ensure that visitors on limited visas leave the country on time.

Reward other acceptable answers only with the approval of the team leader.

- (c) **Define *data mining* and *data matching*. Give an example of each, using government databases.** **[4 marks]**

Award [1 mark] for a definition of each term. Award [1 mark] for each example.

Definitions:

Data mining: discovery of hidden information from a database by use of statistical or AI methods.

Data matching: linking of data in unrelated databases to produce new information.

N.B. Wording does not have to be exact - the concept is important).

Examples:

- data mining: using airport arrival/departure information to discover patterns of behaviour which may indicate illicit activities
- data matching: data about people claiming social security benefits with data stored in tax files
- data matching surveillance camera images with files of wanted criminals/missing persons
- data matching monitoring people's bank accounts and personal finances (alongside employers wage/payroll accounts and government tax files), to discover illegal earnings and/or tax evasion.

N.B. There are numerous possible examples here. Use your discretion to reward any valid examples.

- (d) **Discuss *three* social *and/or* ethical concerns which the individuals should have about personal data being stored in government databases other than the example of data matching cited in part (c). Evaluate your arguments.**

[10 marks]

Award up to [3 marks] for each concern fully discussed.

Award only [1 mark] if each concern is only stated.

Award up to [3 marks] for evaluation.

There could be a maximum [12 marks] indicated, but the maximum you may award is [10 marks] (i.e. if there are 10, 11 or 12 ticks mark awarded is 10).

- Accuracy: -is it verified?
 -how regularly is it updated?
 -how is accuracy checked
 -how is it corrected?

- Access -who has access? cross agency sharing?
 -how is access controlled?
 -what non-government agencies have access (is it shared?)

- Individual rights -can individuals view data about self?
 -can individuals have data corrected?
 -what compensation, for problems of incorrect data?

- Collection of data -how is it collected?
 -is there a breach of privacy?
 -is collection method transparent and legal?

- Security of data -what security precautions are taken?
 -how is security of data tested?
 -individuals rights in case of breach of security?

N.B. This discussion will necessarily be open ended. Use the notes contained in the document “how to mark extended response questions” and your professional judgment for the 2nd and 3rd mark in each issue.
