

# **MARKSCHEME**

**November 2003**

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

**Standard Level**

**Paper 2**

**SECTION A**

1. (a) **State the field type in the database for the “age” field and for the “gender” field.** **[2 marks]**

*Award [1 mark] for identifying each field up to a maximum [2 marks].*

- Age: number field (cannot be a text field)
- Gender: text field, enter “M” for male and “F” for female

- (b) **The student council could query the database using the information from *three* fields to determine the types of articles to be included in the newsletter. State the three fields, describe the query with at least three fields and outline an example of the newspaper article which would be published.** **[4 marks]**

*Award [1 mark] for stating all three fields. Award up to a maximum of [2 marks] for description of the query and result of the query. Award [1 mark] for outlining an example of the kinds of articles which could be included. Maximum total for this part of the question is [4 marks].*

Possible scenarios:

- fields: age, gender, interests  
query / result finding out the interests of women of various ages could show there is a high percentage of women aged over 30 interested in sports (reference must be made to at least three fields for **[2 marks]**)  
article: specific sports articles such as tennis and aerobics for women over 30
- fields: gender, occupation, interests, annual income  
query / result finding out the interests of professional males with varying incomes could show there are a large number of professional men with salaries over \$ 50 000 interested in computers (reference must be made to at least three fields for **[2 marks]**)  
article: articles on technical issues related to computers
- fields: gender, occupation, interest,  
query / result finding out the interest of self-employed males could show that there are a number of people in this category interested in literature (reference must be made to the three fields for **[2 marks]**)  
article: publish bestseller list or critical reviews of books targeted for self-employed males
- fields: age, occupation, interest,  
query / result finding out the interest of students under 17 could show there are a number of people in this category interested in cinema (reference must be made to the three fields for **[2 marks]**)  
article: publish reviews for the movies currently being shown in the cinema.

*Reward other acceptable answers.*

- (c) **Explain *two* reasons why a database is used to analyse data from the survey.** **[4 marks]**

*Award [2 marks] for each reason fully explained up to a maximum of [4 marks]. Award only [1 mark] if the reason is only stated but not explained.*

- A database allows information to be searched and sorted in order to obtain various statistical results.
- Analysis can be done using a database which would be difficult and time-consuming if done by looking at the individual survey forms.
- Queries allow data to be translated into useful information for decision-making.
- The survey is structured so that each completed survey can be represented by a record and each question by appropriate field(s) which allows the information to be analysed.
- Correlations can be found between the various fields in the database which may not have been realized otherwise.

*Reward other acceptable answers. Answers must focus on the analysis of data.*

- (d) **Discuss *three* social or ethical consequences that may arise from the misuse of such a database.** **[10 marks]**

*Award up to [3 marks] for a full discussion of each social or ethical consequence up to a maximum of [9 marks]. Award [1 mark] for each social or ethical consequence which is only stated up to a maximum of [3 marks]. Award [1 mark] for evaluating the arguments. This [1 mark] could be awarded for: (i) weighing-up the positive and negative aspects of at least one of the consequences and deciding if the advantages outweigh the disadvantages; (ii) commenting on the overall importance of the three consequences; (iii) deciding on the importance of at least one of the consequences and/or indicating a hierarchy of importance.*

*Maximum total for this part of the question is [10 marks].*

- If information is made available to the marketing industry, people could be flooded with mail offering products related to their interests.
- If information is made public in the newsletter, people may feel that their privacy has been invaded by the release of data on their income, marital status or education level.
- If information from Personal Data and interests fell into the wrong hands, a person's welfare may be threatened.
- Students might be morally affected by the disclosure of parental private information.

*Reward other acceptable answers.*

**SECTION B**

2. (a) Describe *two* situations in the airline industry where computerized systems could replace a human employee. **[4 marks]**

*Award [2 marks] for each situation fully described up to a maximum of [4 marks]. Award [1 mark] if the situations are only stated up to a maximum of [2 marks].*

- Booking seats on the Internet using search facilities and online booking forms
- Checking tickets at boarding by reading a boarding pass and matching details against a passenger database
- Using automatic pilots to make precise calculations for flight paths
- Check-in of passengers and luggage, assigning seating and issuing the boarding pass
- Using body scanners to detect if a person is carrying items which are prohibited on planes.

*Reward other acceptable answers.*

- (b) Describe *two* computerized systems which can be found on board an aircraft. **[4 marks]**

*Award [2 marks] for each computerized system fully described up to a maximum of [4 marks]. Award only [1 mark] if the computerized system is identified but not described up to a maximum of [2 marks].*

- Passengers can access an entertainment system which includes games and multimedia information about the destination.
- Emergency systems for evacuation.
- Pilots can use computerized instruments to navigate and land the plane, monitor aircraft systems, and control autopilot functions.
- Passengers can follow the flight path and details regarding height and speed on large monitors.

*Reward other acceptable answers.*

- (c) **Discuss *three* social or ethical considerations that could arise from the use of a Wide Area Network in the airline industry. A weighing-up of arguments is required in the response.** **[12 marks]**

*Award up to [3 marks] for a discussion of each of three social or ethical considerations up to a maximum of [9 marks]. Award [1 mark] if the social or ethical consideration is only stated up to a maximum of [3 marks]. Award up to [3 marks] for evaluating the arguments. These [3 marks] could be awarded for: (i) weighing up the positive and negative aspects of each consideration and deciding if the advantages outweigh the disadvantages; (ii) commenting on the overall importance of each of the three considerations; (iii) deciding on the importance of each consideration and indicating a hierarchy of importance. Maximum total for this part of the question is [12 marks].*

- Travellers can conveniently book airline tickets from anywhere in the world which results in better service and more flights being sold.
- Airline personnel can easily search and sort data and produce reports in stress situations such as locating of lost luggage and producing passenger lists.
- Loss of jobs in the airline industry.
- Retraining of users whenever there is an upgrade or new implementation on the airline WAN.
- Travel agents can quickly investigate the best possible travel arrangements for a particular destination for their customers.
- Travellers suffer from significant inconveniences and travel delays whenever there are problems in the functioning of the airline WAN.

*Award only answers specific to the use of a Wide Area Network in the airline industry and not answers which are applicable to any Wide Area Network.*

*Reward other acceptable answers.*

3. (a) State *two* different types of confidential information (other than personal information such as name, address or telephone number) which could be contained in the database which was sold and outline why this should remain confidential. **[4 marks]**

*Award [1 mark] for identifying each type of confidential information up to a maximum of [2 marks]. Award [1 mark] for identifying why this information is confidential up to a maximum of [2 marks]. Maximum total for this part of the question is [4 marks].*

- Medical illness or conditions should remain confidential because employment could be rejected in cases of certain illnesses.
- Medical illness or conditions could cause people to avoid contact with the person.
- Medication may affect a person's performance in their work.
- Medication may give an indication of the type of illness which a person has which is an invasion of privacy.

*Reward other acceptable answers.*

- (b) Describe *two* methods which could have been used to collect the data in the drugstore customer database. **[4 marks]**

*Award [2 marks] for each method fully described up to a maximum of [4 marks]. Award [1 mark] for each method which is stated but not described up to a maximum of [2 marks].*

- Data was collected from the doctor's prescription and entered into the database.
- Data was collected electronically from customers whose purchases were recorded when they paid by credit card.
- Personal data was collected by the drugstore in the form of surveys, contest forms or other forms completed by the customer and entered into the database.
- Data was collected electronically from online purchases of medical supplies.

*Reward other acceptable answers.*

- (c) **Discuss *three* ethical or social concerns that customers should have regarding the storage of their personal data in the drugstore customer database. A weighing-up of arguments is required in the response. [12 marks]**

*Award up to [3 marks] for each ethical or social concern which is fully discussed up to a total of [9 marks]. Award [1 mark] for each ethical or social concern which is only stated up to a maximum of [3 marks]. Award [3 marks] for evaluating the arguments. These [3 marks] could be awarded for: (i) weighing-up of the positive and negative aspects of each concern and deciding if the advantages outweigh the disadvantages; (ii) commenting on the overall importance of each of the three concerns; (iii) deciding on the importance of each concern and indicating a hierarchy of importance. Maximum total for this part of the question is [12 marks].*

- Does the customer have access to the data that has been collected?
- Who has access to the data?
- Will the data be made available to other businesses or institutions?
- Is the data matched to other medical records which are being maintained about the customer?
- What effort is made within the drugstore to protect the data from unauthorised access?
- How long will the data be kept that has been collected?
- Who owns the data?

*Do not accept answers which address the issue of how the data has been collected. This was addressed in part (b) of the question.*

*Reward other acceptable answers.*

4. (a) **Outline the difference between analogue and digital television images. [2 marks]**

*Award [1 mark] for an outline of each technology up to a maximum of [2 marks]. Award [1 mark] if only one technology is outlined.*

Digital TV images are stored as zeros and ones whereas TV images were originally stored and broadcast as analogue electronic waves.

(b) **Describe three features that are available with digital TV but not analogue TV. [6 marks]**

*Award [2 marks] for each feature which is fully described up to a maximum of [6 marks]. Award [1 mark] for each feature which is only stated but not described up to a maximum of [3 marks].*

- Digital data can be edited and changes can be stored and played back again.
- Error checking of digital data results in higher quality transmission.
- Data compression enables more signals on the same bandwidth.
- Digital information can be searched allowing viewers to find particular segments.
- Different views of an event can be seen simultaneously.

*Reward other acceptable answers.*

(c) **Discuss three social or ethical considerations that could arise from the interactive nature of digital TV, which enables two-way information transfer. A weighing-up of arguments is required in the response. [12 marks]**

*Award up to [3 marks] for each social or ethical consideration which is fully discussed up to a maximum of [9 marks]. Award [1 mark] for each social or ethical consideration which is only stated up to a maximum of [3 marks]. Award up to [3 marks] for evaluating the arguments. These [3 marks] could be awarded for: (i) weighing up the positive and negative aspects of each consideration and deciding if the advantages outweigh the disadvantages; (ii) commenting on the overall importance of each of the three considerations; (iii) deciding on the importance of each consideration and indicating a hierarchy of importance. Maximum total for this part of the question is [12 marks].*

- Are viewers aware of the nature and amount of information being collected about them?
- What is the purpose of this data collection? Is the viewer aware of the purpose? Is the information being used only for the purpose originally stated?
- Is the information accurate, relevant, complete, and up to date? Is it discarded when it is out of date or no longer relevant?
- Who has access to the information?
- How secure is the information? Are there adequate protection methods in place?
- Is the information given or sold to any other organisations?

*All responses must be specifically focused on digital TV.*

*Reward other acceptable answers.*



5. (a) **Outline *two* situations where plagiarism could occur and how IT tools or methods could be used to detect plagiarism in each situation.** [4 marks]

*Award [1 mark] for each situation which is outlined up to a maximum of [2 marks]. Award [1 mark] for outlining how IT tools could be used to detect plagiarism in each situation up to a maximum of [2 marks]. Maximum total for this part of the question is [4 marks].*

- Situation:  
information can be copied and pasted from a web page without citing a bibliographic reference  
Detected by:
  - entering the text into a search engine which searches for text on web pages
  - using a special web site with web tools which can analyse the extent to which an assignment has been plagiarized
  
- Situation:  
information could be copied and pasted from an encyclopedia stored on CD-ROM without citing a bibliographic reference  
Detected by:
  - pasting the questionable article from the electronic encyclopedia into a word processor and using the find command to locate the questionable text
  
- Situation:  
a student could take the electronic version of another student's work and change a few of the words to make the document look like his own.  
Detected by:
  - saving and cataloguing of the electronic versions of students' work and being able to compare the assignments of students electronically.
  
- Situation:  
downloading a research paper from an Internet site and submitting it as one's own work.  
Detected by:
  - checking a suspicious paper on known plagiarism sites
  - the paper can be submitted to a site which checks for plagiarism.  
Answers must use IT tools.

*Reward other acceptable answers.*

- (b) **Describe *two* actions which authors can take to prevent their work being plagiarised when placed on the World Wide Web.** [4 marks]

*Award up to [2 marks] for each action which is fully described up to a maximum of [4 marks]. Award only [1 mark] for each action which is stated but not described up to a maximum of [2 marks].*

- The author of the document can use special software or features of an application to place an electronic watermark on their document.
- The author can submit the electronic version of their document to web services which commercially checks student work for plagiarism.
- The author should not store the actual text of documents on the Internet in either web pages or downloadable files; pdf files should be created.

*Reward other acceptable answers.*

- (c) **Describe *two* actions which students should take to avoid the suspicion of plagiarism when they use information from the World Wide Web. [4 marks]**

*Award up to [2 marks] for each action which is fully described up to a maximum of [4 marks]. Award [1 mark] for each action which is only stated but not described.*

- When taking notes, students should put quotations around text which is copied word-for-word and acknowledge the source.
- Students need to check text which they have paraphrased to ensure it has the proper bibliographic entry.
- Students must use an acceptable format for citing sources within the document as footnotes and also in the bibliography.
- Students must recognize that almost all information is copyrighted and read the copyright notice which accompanies electronic documents and printed materials and adhere to the conditions when using the information.

*Reward other acceptable answers.*

- (d) **Discuss *two* social consequences which arise as a result of plagiarism from the World Wide Web. A weighing-up of arguments is required in the response. [8 marks]**

*Award up to [3 marks] for each social consequence which is fully discussed up to a maximum of [6 marks]. Award [1 mark] for each social consequence which is only stated but not discussed up to a maximum of [3 marks].*

*Award up to [2 marks] for evaluating the arguments. These [2 marks] could be awarded for: (i) weighing-up the positive and negative aspects of each consequences and deciding if the advantages outweigh the disadvantages; (ii) commenting on the overall importance of each of the **two** consequences; (iii) deciding on the importance of each consequence and indicating a hierarchy of importance. Maximum total for this part of the question is [8 marks].*

- Qualifications in the long term could lose their validity (weaker candidates get artificially high grades, qualification becomes meaningless, individuals who have not plagiarized could be affected by the lower regard of the qualification).
- Interpersonal relationships in a learning environment suffer (conflict amongst students because of an awareness of plagiarism, conflict between the teacher and student over plagiarism, loss of respect for the student).
- Low morale among examiners due to spending their time looking for cheating instead of being able to reward honest work.
- Lowered public opinion for the school, university or examination institution which does not aggressively combat plagiarism from the web.
- Plagiarism encourages the growth of sites where students can obtain plagiarized material.
- Students who plagiarize may suffer severe consequences (loss of a year of study, dismissal, difficulty in being admitted to other schools or universities).

*Reward other acceptable answers.*

---