

# **MARKSCHEME**

**NOVEMBER 2000**

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

**Standard Level**

**Paper 2**

**SECTION A**

1. (a) (i) (*Award [1 mark] for any of the statements below.*)
- Patient Number fields relate or link the two databases together.
  - Patient Number field is a key field for the relational database.
- (ii) (*Award [1 mark] each for any of the points below up to [2 marks] maximum.*)
- Patient Number field allows the doctor to trace the visits that a doctor has made to a patient's home.
  - The doctor can track all of the medicine a patient has been prescribed.
  - The doctor can determine if illnesses are specific to a geographical area.
  - The doctor can determine if illnesses are specific to a time of year.
- (*Reward other acceptable answers.*)
- (b) (*Award [1 mark] each for any of the points below with some justification, up to [3 marks] maximum.*)
- A computer with network access capability is located in each office for access by the doctor and other office staff.
  - A computer network to allow multi-user access to the database.
  - A file server to allow multi-user access to the data.
  - Several computers connected through a digital media (cable, fiber optics, wireless connection, etc.)
- Don't accept:** Multiple PCs without an indication of the existence of a network.
- (*Reward other acceptable answers.*)
- (c) (*Award [1 mark] each for any of the points below with some justification up to [2 marks] maximum.*)
- A relational database reduces the need to duplicate data and reduces storage space.
  - Separating the patient data from the visitation data can help in keeping illnesses and prescriptions confidential.
  - The patient data can be used for mailings without accessing the visitation data.
  - A relational database reduces the need to store duplicate information and eliminates redundancy.
  - Patient Data can be consistently updated in a relational database but has to be updated in a flat file database in all of the fields in which it occurs which can lead to inconsistencies.
  - Retrieval of data is faster because only the relevant data is retrieved.
- (*Reward other acceptable answers.*)
- (d) (*Award [1 mark] each for any of the points below with some justification up to [2 marks] maximum.*)
- Address
  - Telephone number
  - Illness
  - Symptoms
  - Prescribed Treatment or Prescription
- (*Reward other acceptable answers.*)

(e) (Award [**1 mark**] for each security measure up to a maximum of [**2 marks**]. Award full marks only if the measure is stated and a reason why data will be secure is given)

- Require password access to the patients' data.
- Require separate passwords for demographic data and medical data **or** limit the level of access based on user's identification.
- Place computers in secure locations.
- Require new logins after some period of inactivity.
- Virus protection to keep data safe.
- Have a firewall if you are connected to the Internet.

(Reward other reasonable security measures.)

(f) (Award [**1 mark**] for any valid suggestion which is simply stated and award [**2 marks**] for valid suggestions which are stated and further developed up to a maximum of [**4 marks**].)

- The symptoms field could become several fields: temperature, blood pressure, *etc.* for more accurate record-keeping.
- The specific medication should be entered in order to know what medicine the patient has been prescribed.
- Any allergies which the patient has should be recorded in the patient data.
- A more medically precise name for the illness should be entered.
- Introducing validation rules to data input.

(Reward other reasonable changes.)

(g) (Award [**2 marks**] for each policy suggested and developed up to a maximum of [**4 marks**]. If the policy is only stated award a maximum of [**1 mark**] for each policy.)

- Do not give patient information to people other than the patient or legal guardian (or the patient only, depending on the country).
- Give employees access only to data they need to perform their job.
- Have the software (database) manager display only the data needed by an employee, *i.e.* use an employee data table to determine the level of access.
- Security procedures must be implemented and followed to prevent unauthorised access.
- Ask for patient agreement on which data related to them is kept.

(Reward other reasonable policies.)

## SECTION B

2. (a) (Award [**1 mark**] for each teaching method using IT digital media which is stated **and** whose purpose is given, up to a maximum of [**4 marks**]. If the digital media is only stated award [**0 marks**] per example.)

- A history teacher may show slides using presentation software to deliver the main points of a lesson.
- An art teacher might illustrate an art history lesson with a series of images from a CD ROM.
- A science teacher may use an animated model to demonstrate the way in which the heart works.
- An English teacher can supplement classes about a novel by showing selected video clips that have been digitised into a presentation.
- A geography teacher uses multimedia to create interactive lessons on the rain forest.

(Reward other acceptable answers.)

- (b) (Award [**2 marks**] for each situation explained up to [**4 marks**]. Award [**1 mark**] for each situation if it is only stated.)

- The projection device may have technical problems that the teacher is not able to solve.
- An error message may appear during a presentation and the application or the system must be restarted, making the teacher lose too much time.
- A multimedia presentation refuses to play sounds or to display images and it does not allow the teacher to organise the class as planned.

### **Don't accept:**

- Lack of student's skills
- Lack of teacher training
- Students can play games while the teacher is talking to the students.

(Reward other acceptable answers.)

- (c) (Award [**3 marks**] for each advantage fully discussed up to [**9 marks**] maximum. Award [**1 mark**] for weighing up of the advantages.)

- Digital methods allow for more dynamic assessment methods than traditional ones.
- Digital methods give students access to greater sources of information.
- More efficient methods can be used for presenting information.
- Presentations can be updated and reused at a later time.
- Possible to make presentations available to students who have missed a lesson.
- Video conferencing allows students to follow courses from anywhere even if they are ill.

(Reward other acceptable answers.)

3. (a) *(Award [1 mark] for describing how to locate a product and [1 mark] for describing how to purchase products up to [2 marks] maximum. If payment method is not mentioned award a maximum of [1 mark].)*

Locating a Product

- Customer uses a search engine or directory to locate a product and then navigates to the appropriate site.
- Customer sees the advertisement for a product on a web page and navigates to the site.
- Customer sees the URL address for the product in an advertisement and uses a browser to navigate to the site.
- Customer enters a known URL into the browser.

Purchasing the Product

- Customer provides his personal information such as name, postal address, telephone number and e-mail address.
- Customer enters his credit card information in order to pay for the product.
- Customer pays for the product when it is received.

*(Reward other acceptable answers.)*

- (b) *(Award [1 mark] for each advantage that it is briefly described up to [4 marks] maximum.)*

- Customer can shop 24 hours a day without regard to global time zones.
- Customer is able to purchase global products.
- Customer is able to pay easily with a credit card with no need to make money conversions into another currency.
- Customer is able to communicate easily with the company and make compliments, complaints, suggestions.
- The lower marketing cost benefits the customer by more favourable prices being offered.
- Customer can compare prices from different vendors all over the world.

**Don't accept:**

- Customers don't have to move from their homes to buy items.
- Customers can get goods delivered to their homes.

*If they are not thoroughly explained or compared to mail order catalogues or telephone ordering.*

*(Reward other acceptable answers.)*

(c) *(Award up to [3 marks] for a full description of any of the ethical considerations below up to a maximum [12 marks].)*

- Customer must have a valid credit card for purchases.
- Customer must have provided reliable data about himself, his method of payment, and the recipient's address.
- Company must provide accurate information about the products.
- Company must provide accurate information about its delivery services.
- Company must ensure that the personal data and credit card details of its customers are kept secure.
- Company must warn the client that the transmission of personal information and credit card data is insecure on the World Wide Web.
- Company has the responsibility to collect customer data in a responsible manner and only for the purpose for which it is intended.
- Customer data must be destroyed when it is no longer needed for the purposes for which it is intended.
- Customer data must not be sold or otherwise distributed without the knowledge/approval of the customer.
- Company must check security systems on a regular basis to ensure that only authorised personnel have access to customer data.
- Company must maintain reliable backups of the customer database.
- Data between databases can only be connected with the customer's permission and knowledge.
- Company must be reliable: are goods obtained legally?, would refund be available?, will items be delivered?

*(Reward other acceptable answers.)*

4. (a) (Award [2 marks] for each procedure up to a maximum of [6 marks]. If the procedure is not fully developed award a maximum [1 mark] per procedure)

- Use computer-based codes and not printed codes from an aeronautical chart.
- Have a second person verify the entered codes.
- Have the computer system give ‘feedback’ to the pilots regarding the direction of flight and the actual location of the plane and the request destination as entered into the plane’s computer system.

(Reward other acceptable answers.)

(b) (Award [2 marks] for stating one IT application.)

- Use Global Positioning System to accurately identify the plane’s location.
- Use radar tracking.

(Reward other acceptable answers.)

(c) (Award [1 mark] in each example for identifying who would have been responsible and up to [3 marks] for a description of the ethical issues for that example up to maximum of [4 marks].)

(Award [2 marks] for weighing up.)

(Award an overall maximum of [10 marks].)

- Management of the airlines may be held responsible for not implementing more modern computer-based procedures and data.
- Pilots may be responsible for not verifying the accuracy of the city codes.
- Aeronautics chart makers should ensure that each city has a unique code if this is going to be entered into a computer.
- Designers of the plane’s computer systems should have provided for feedback to the pilots and provided for verification of the city codes.
- Government Aeronautics Boards should formulate and require the use of modern technologies to locate and track planes.

(Reward other acceptable answers.)

5. (a) *(Award [1 mark] for each general function listed, up to a maximum of [3 marks] or Award [1 mark] for a specific task performed by a specific human worker up to a maximum of [3 marks].)*

General task

- Input data.
- Start the system.
- Check hard copies.
- Verify data.
- Output reports.
- Ensure reliable server and network operations.

*(Reward other acceptable answers.)*

**or**

Specific task

- Data entry clerk enters data.
- Computer operator boots the system.
- Middle management checks a report.
- Warehouse manager verifies the inventory list.
- Head of Maintenance ensures the reliable server and network operations.

**Don't accept:**

- Training.

*(Reward other acceptable answers.)*

- (b) *(Award [2 marks] each for stating and explaining any of the points below up to a maximum [4 marks].)*

- Examine the current system and evaluate its effectiveness.
- Query the user to identify information needs.
- Give questionnaires to all the people involved in or using the system.
- Interview all the people involved in or using the system.
- Arrange for external consultants to analyse the information system.
- Compare the present information system with those used in similar organisations.

*(Reward other acceptable answers.)*



(c) *(Award [3 marks] for each ethical consideration fully described up to [9 marks]. Award [2 marks] for weighing up the considerations.)*

- Who is responsible for testing that the information system functions properly?
- Does the information system cause anyone or group of individuals harm?
- What ethical practices will be used with respect to personal data in the information system?
- How will the data in the information system be kept secure?
- Has anyone been disadvantaged by the installation of the information system?
- What policies will be implemented in the organisation to ensure ethical practices are followed?
- Will employee-monitoring software be implemented as part of the information system?
- What are the criteria which determines who receives training and at which level?
- Have jobs been lost due to the implementation of the information system?
- Install software for which the corresponding licences have been purchased.

*(Reward other acceptable answers.)*

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