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INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY
STANDARD LEVEL
PAPER 2

Friday 10 November 2000 (morning)

2 hours

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Answer Section A and two questions from Section B.

SECTION A

Read the information below and then answer the questions that follow.

1. The power of computers to store, search, sort and display vast amounts of data has lead to an increasing number of small businesses and offices using databases. In the medical profession, doctors keep records which contain information about the patients, office or home visits, illnesses, symptoms and prescribed treatments. Doctors, with the assistance of their office staff, are converting these paper records into electronic databases on computers. An important consideration is that patient records should be available at the same time to the doctor and other staff working in different offices.

The process of creating and maintaining a database requires much planning and technical advice. A doctor has decided to use a relational database to store the information about patients and home visits as indicated in the records information below.

Table 1: Patient Data

Patient Number	First Name	Last Name	Street Address	City	Postcode	Phone Number	Gender
1234	Jason	Jones	18 Oak	Kaw	1220	3456789	M
1618	Kay	Smith	7 Pine	Newet	3456	6789039	F
2380	Abe	Choi	8 Park	Newet	3456	5678930	M
3012	Brett	Dann	78 Real	Atalant	1150	5678452	F

Table 2: Home Visits Data

Patient Number	Date	Illness	Symptoms	Prescribed Treatment
1234	January 4, 1999	Measles	Fever, Red Spots	Prescription
1618	January 4, 1999	Cold	Fever, Sore Throat	Prescription for Sore Throat
2380	January 5, 1999	Measles	Fever, Red Spots	Prescription
3012	January 6, 1999	Cold	Fever, Sore Throat	Prescription for Sore Throat

(a) (i) What is the relationship between the two tables? *[1 mark]*

(ii) Identify **two** relationships that a doctor can derive from using the two tables together. *[2 marks]*

(b) Describe **three** hardware considerations which are necessary for the doctor and other office staff to be able to access the patient database at the same time. *[3 marks]*

(This question continues on the following page)

(Question 1 continued)

(c) Explain **two** reasons why it is better for the doctor to use a relational database instead of a flat-file processing system. *[2 marks]*

(d) Describe **two** types of personal data contained in the database which would be regarded as confidential. *[2 marks]*

(e) Describe **two** security measures which are necessary to ensure that the patients' data is secure. *[2 marks]*

(f) After using the database for several months, the doctor decides to make some changes to allow for more accurate and precise record-keeping. Describe changes which could be made to the database to achieve this. *[4 marks]*

(g) Suggest **two** policies that the doctor should establish in the office to ensure the ethical use of the database. *[4 marks]*

SECTION B

*Answer **two** questions. Up to **two** additional marks are available for the quality of construction of each of your answers.*

2. A growing number of teachers are using information technology digital media to convey information in a more dynamic form. Traditional teaching methods are becoming obsolete and are being gradually replaced by high tech media.

(a) State **four** examples of how teachers in four different subjects can use information technology digital media in class. *[4 marks]*

(b) Explain **two** technology related problems that a teacher may have when using information technology digital media in class. *[4 marks]*

(c) Discuss **three** advantages of digital presentations or delivery in education over traditional teaching methods. *[10 marks]*

3. On-line shopping is one of the fastest growing businesses on the World Wide Web.

(a) Describe how a customer locates and purchases a product on the World Wide Web. *[2 marks]*

(b) Describe **four** advantages for the customer of being able to purchase goods on-line. *[4 marks]*

(c) Discuss **four** ethical considerations arising from the ability to purchase products and services on-line. *[12 marks]*

4. The following article was published in a newspaper.

Computer error kills 163 people

An airplane in Colombia crashed into a mountain killing 163 people. The captain of the plane entered an incorrect one-letter computer command.
Investigators said the captain of the plane thought he had entered the correct code for the intended destination, Cali. Instead, he entered the code for Bogota, 132 miles in the opposite direction.

Unfortunately, the captain entered a code taken from a printed South American aeronautical chart where the one-letter code for Cali is the same as the code for Bogota. The printed chart code for Bogota directed the plane toward the mountain where it crashed. "Unlike the printed charts, the codes for Bogota and Cali are different in computer databases," an official said.

(a) Outline **three** procedures that could have been used to prevent a disaster like the one in Colombia. *[6 marks]*

(b) State **one** application of information technology that can be used to determine a plane's exact location almost instantly. *[2 marks]*

(c) Give **two** examples of who might have been responsible for this disaster and discuss the ethical issues they should have considered in applying information technology in this case. *[10 marks]*

5. An information system needs people, hardware, software, data, methods and policies to accomplish specific functions.

(a) List **three** tasks that human workers may have to perform in operating an information system. *[3 marks]*

(b) Explain **two** steps which an organisation could take to decide what changes could be made to improve an existing information system. *[4 marks]*

(c) Discuss **three** ethical considerations arising from the implementation of an information system in an organisation. *[11 marks]*