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**INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY**
**STANDARD LEVEL**
**PAPER 2**

Tuesday 20 May 2008 (morning)

2 hours

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Section A: answer all parts of the question.
- Section B: answer two questions.

**SECTION A**

*Answer **all** parts of the question.*

**Area of Impact: Business and Employment**

1.  Telecommuting allows an employee to work from home and communicate with the office using telecommunications technology.  Using a home computer employees can access information on the office computer servers.

    (a)  Identify **two** collaborative IT tools a worker may use when telecommuting.  *[2 marks]*

    (b)  Describe how **two** advances in technology have led to an increase in telecommuting.  *[4 marks]*

    (c)  Distinguish between the use of biometrics and passwords as a means of authenticating an employee who remotely logs on and accesses the company's server.  *[4 marks]*

    (d)  To what extent are employees' concerns about telecommuting outweighed by the advantages to **both** the employer **and** the employee?  *[10 marks]*

**SECTION B**

*Answer one questions.*

**Area of Impact: Education**

2.  Many schools are now offering a new educational resource for their students. Families and teachers have access to a password-protected web site where students may find information that has been provided for them.

    In this web site there are links to different subject areas where teachers can place exercises, past exam papers, revision tools and even photographs from past field trips. Students and parents may access this site from school or from home.

    The following is an example of one of the subject's main pages.



| Biology | | | |
|---|---|---|---|
| **Past exam papers** | **Exercises:**<br>• Digestion<br>• Respiration | **Homework for this week:**<br>• Year 3<br>• Year 5 | **Interesting links:**<br>• Global warming<br>• Investigations |
| | **Photos:**<br>• Field trip year 2<br>• Field trip to the jungle<br>• Activity in class | | |

(a)  Describe how a password-protected web site operates.                                    *[2 marks]*

(b)  Describe **two** IT features that a computer user would require to access or use this site.                                    *[4 marks]*

(c)  Explain how the new web site could improve student learning.                            *[4 marks]*

(d)  This system may be a great advantage for students, but it may place teachers with limited IT skills under great pressure.

    Discuss the concerns of some teachers when they are asked to make this new resource available for the students.                            *[10 marks]*

**Area of Impact: Health**

**3.** Barnsley Hospital, UK, has a new project to monitor the health of heart patients outside the hospital.

This method uses a special wrist device with a sensor to capture medical information continuously from the person using it.

Information may then be transmitted using an infrared link to a "plug and play" device. This device can be connected to the USB port of a computer and the information is then sent to the patient's doctor over the Internet.

[Source: http://www.mtbeurope.info/news/2006/603025.htm, March 2006]

Images used with the permission of Telcomed Advanced Industries Limited (www.telcomed.ie)

| Miniclinic Wrist Unit [Source: http://www.telcomed.ie/wristwatch.html, Dec 2006] | Minigate [Source: http://www.telcomed.ie/minigate.html, Dec 2006] |
| --- | --- |
| Wrist device to capture information from patient | USB device to communicate with wrist device and then send information over the Internet when plugged into a computer |

(a) Identify **two** features of a sensor. *[2 marks]*

(b) Describe **two** advantages of using a USB memory device for the storage of medical information. *[4 marks]*

(c) Explain **two** advantages for the hospital of having a patient at home using these monitoring devices. *[4 marks]*

(d) Evaluate possible solutions to overcome the issues of reliability **and** privacy of data when patients use this technology. *[10 marks]*

**Area of Impact: Arts, Entertainment and Leisure**

**4.**     Increasing numbers of tourists are using digital cameras to take photos during their holidays.

Two digital cameras are shown with their specifications.

**Camera A**



- 1.9 million pixel chip
- 8 MB card

*Canon Powershot S330 (online image)*
*http://www.dpreview.com/reviews/specs/Canon/canon_s330.*
*asp [20 Aug 2006]*

**Camera B**



- 8.0 million pixel chip
- 32 MB card

*Canon Powershot S80 (online image)*
*http://www.dpreview.com/reviews/canons80/ [13 Aug 2006]*
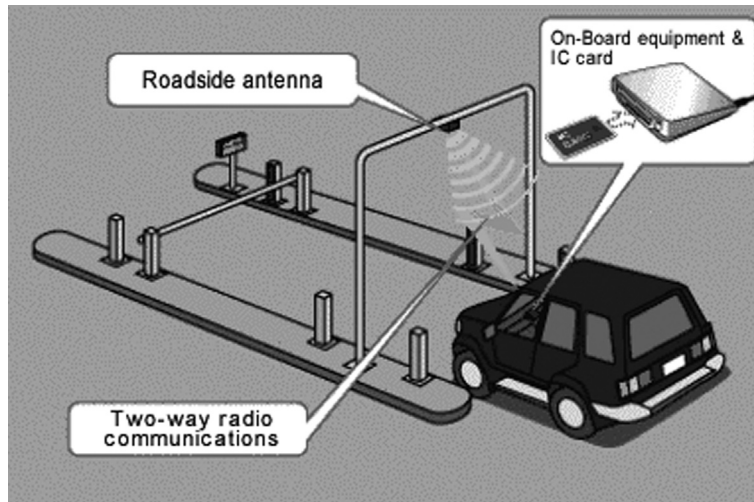
(a)     Define the terms *pixel* **and** *mega byte*.                                   *[2 marks]*

(b)     Describe **two** ways that tourists on holiday can share digital photos with their
family at home.                                                                 *[4 marks]*

(c)     Explain **two** benefits of saving digital photos in the jpg format.          *[4 marks]*

(d)     Unlike traditional photos, digital photos are easily stored and distributed.
Evaluate the concerns that may arise from these developments.          *[10 marks]*

**Area of Impact: Science and the Environment**

5.  Many countries are now using data logging to capture information at automatic toll gates.

Car drivers place a device on the car windscreen that contains a number identifying the driver. The scanner reads this number. This information is matched with records in the driver database and the driver's record is retrieved. The driver is allowed through if the account is in credit.

Since tolls are automatically paid at toll gates in this way, the driver can pass through without stopping the vehicle.



[Source: Source: www.mlit.go.jp/road/ITS/index.html]

(a)  Identify **two** processes involved in data logging. *[2 marks]*

(b)  Describe **two** other ways that automatic data logging may be used. *[4 marks]*

(c)  Explain **two** advantages of using automatic data logging to keep records compared with manual data logging. *[4 marks]*

(d)  Information obtained at automatic tolls may also be used to map traffic information and help drivers travel on the highways. Some cards may also contain customer's information or an identification number to relate the customer to a record in a driver database for later use.

To what extent do the concerns about invasion of drivers' privacy outweigh the advantages of using this system to improve the traffic of cars in a city? *[10 marks]*

**Area of Impact: Politics and Government**

**6.**    A Government is introducing a smart card for all its citizens.  Each citizen will now need only one card instead of up to seventeen separate cards.  Each card will carry the unique ID number of its holder.

   The Government aims to reduce health and welfare fraud by increasing information sharing and matching between government departments (Riley 2006).  This idea has not been welcomed by all citizens.



   (a)    Define the term *smart card*.                                                                      *[2 marks]*

   (b)    Some cards store minimal identification details such as patient ID. Describe how any doctor will be able to retrieve the full details of a patient during a medical consultation.                                                                      *[4 marks]*

   (c)    Explain how data matching will help reduce welfare fraud.                       *[4 marks]*

   (d)    Discuss the concerns for citizens of the introduction of this smart card.       *[10 marks]*