



22105512



International Baccalaureate®
Baccalauréat International
Bachillerato Internacional

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

Friday 21 May 2010 (morning)

2 hours

INSTRUCTIONS TO CANDIDATES

- Do not open this examination paper until instructed to do so.
- Answer three questions.

Answer **three** questions.

Area of impact: Business and employment

1. Visits to the bank are becoming less frequent as more customers use ATMs (automated teller machines) to carry out banking transactions such as withdrawal of funds or deposit of money. Some people, however, are concerned that their accounts may not be safe due to fraud involving ATM cards and ATM machines.

Many banks also offer online services. These services include the ability to check your bank balance, transfer money, pay bills and receive alerts.

[Source: adapted from fraud www.snopes.com/fraud/atm/atmcamera.asp and mobile banking www.anz.co.nz/promo/anzmobilebanking/default.asp, 25 August 2008]

- (a) Identify **two** output devices on an ATM. *[2 marks]*
- (b) Describe **one** example of fraud involving an ATM card and **one** possible solution to this crime. *[4 marks]*
- (c) Explain **two** validation processes that take place when you use the ATM to withdraw money from your bank account. *[4 marks]*
- (d) To what extent does the improved customer service offered by online banking outweigh the possible disadvantages for customers? *[10 marks]*

Area of impact: Politics and government / Arts, entertainment and leisure

2. The World Wide Web has created a new medium that presidential candidates use to campaign during elections. Before web technologies were available, candidates used broadcast media such as television, radio and newspapers to reach voters.

Currently, documents from candidates and political parties can be downloaded from a web site in PDF format. In addition, many candidates also have a presence on social networking sites such as *MySpace* or *Facebook*.



[Source: www.myspace.com/barackobama, 17 August 2008]

- (a) For the URL <http://www.barackobama.com/newsroom/index.php>,
- (i) identify the protocol [1 mark]
 - (ii) identify the domain name. [1 mark]
- (b) Describe **two** ways in which information can be sent to you on a regular basis from a political party using the Internet. [4 marks]
- (c) Explain **two** reasons why party documents are stored on web sites in PDF format rather than as word processed documents. [4 marks]
- (d) Evaluate the increasing use of the Internet in political campaigning by candidates. [10 marks]

Area of impact: Science and the environment / Education

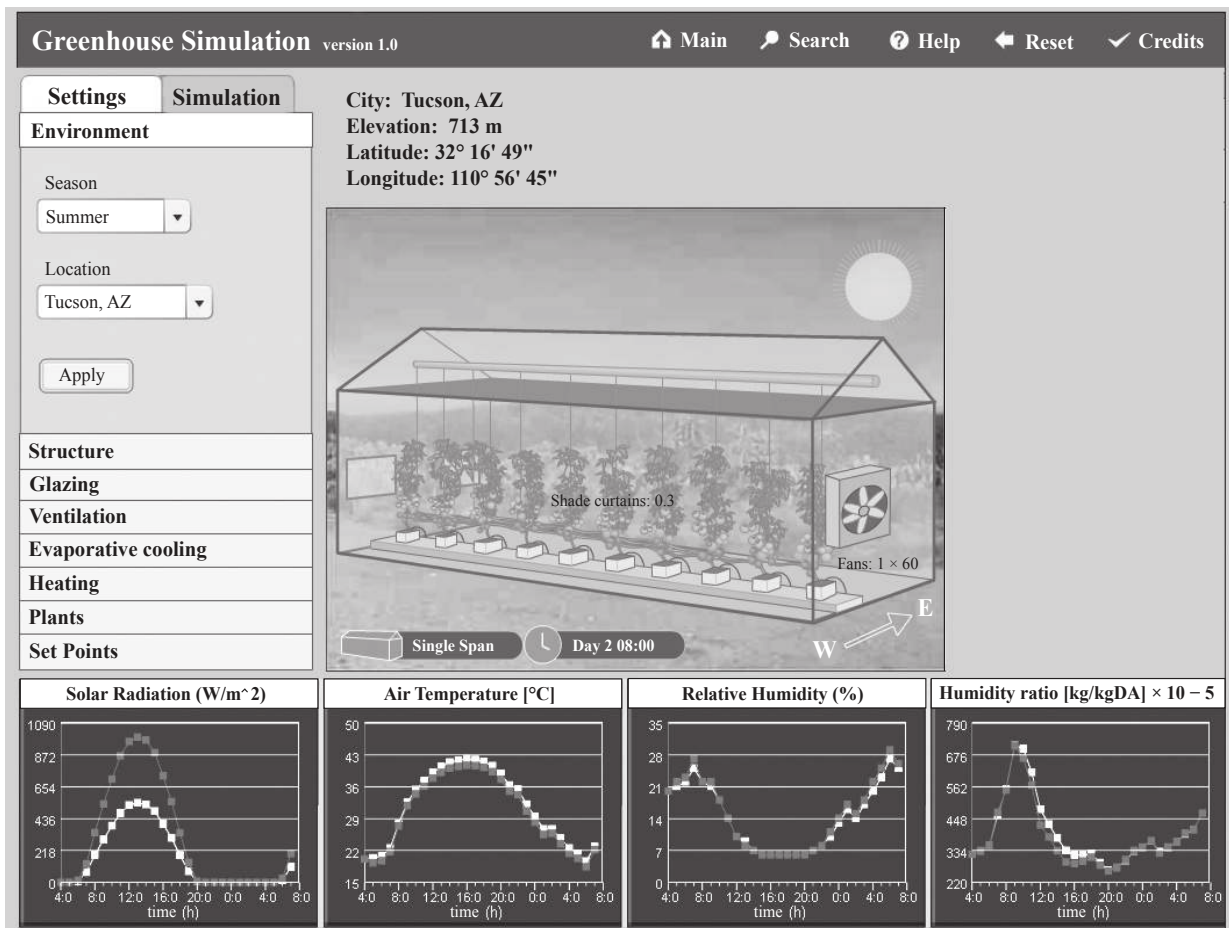
- 3. With the potential increases in the cost of energy, many farmers in North America are concerned about the efficiency of their greenhouses. One possible solution is to use a greenhouse simulator to experiment with the different designs and materials in the construction of their greenhouses.

In a simulation, users can vary inputs and when the simulation is run the results are displayed (see Diagram).

By using the results from a simulator to plan the building of greenhouses, farmers can produce crops more efficiently and reduce their energy bills.

Many teachers find it useful to use simulations such as these in agricultural science classes.

Diagram



Reprinted with permission from Worldwide Greenhouse Education.

(This question continues on the following page)

(Question 3 continued)

- (a) From the simulation shown in the Diagram on the previous page,
 - (i) identify **one** input *[1 mark]*
 - (ii) identify **one** output. *[1 mark]*
- (b) Describe **two** tasks which must be performed in the development of simulation software like that used in the Diagram on the previous page. *[4 marks]*
- (c) Explain **two** benefits of using this simulation in the agricultural science classroom. *[4 marks]*
- (d) To what extent should a commercial farmer rely upon a computer simulation such as this when planning to build a greenhouse? *[10 marks]*

Area of impact: Health

4. A biotechnology company has been commissioned to develop a database to store genetic data on all citizens in Iceland for the purpose of medical research. The country was chosen because of its isolation and small population resulting in a small gene pool¹.

Citizens are required to give a blood sample which is processed to provide a genetic profile². This profile can then be matched with details such as age, weight, and medical history to predict potential future health issues that may be linked to the genetic backgrounds of individuals.

Data is made anonymous by replacing personal details with an ID number. This is used as a key field in the database. Some citizens have expressed concern about the collection of this data and have challenged its legality in court.

[Source: adapted from <http://news.bbc.co.uk/1/hi/sci/tech/630961.stm>, 17 August 2008 and www.motherjones.com/news/special_reports/1998/05/marshall.html, 17 August 2008]

¹ gene pool: total number of genes in a population
² genetic profile: the information about a person's genes

- (a) Define the term *key field*. [2 marks]
- (b) Describe the process used to create a query which would produce an alphabetical list of all the citizens who have suffered from diabetes, were born after 1990 and do not smoke. [4 marks]
- (c) Explain the difference between data matching and data mining with reference to the Icelandic database. [4 marks]
- (d) To what extent do the advantages to medical research outweigh the concerns of some Icelandic citizens about storage of their genetic data? [10 marks]
-