



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

Thursday 19 November 2009 (morning)

2 hours

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**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.

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## SECTION A

Answer **all** parts of the question.

### Area of impact: Business and employment

1. Many businesses have now become completely reliant on IT to enable their continued development. For example, some companies have no fixed office space, yet have been able to grow and gain a large share of their market. Their employees use IT to telework. This has had significant effects on the size and the nature of the companies. IT has also improved the working conditions for the employees who telework.

Domain names are also important to companies relying on IT and are often described as “virtual real estate”. Companies, such as *Toys “R” Us*, have been known to pay a considerable amount of money for a domain name (<http://www.toysrus.com>) because a well chosen domain name can be an asset.

- (a) For the following URL: <http://www.richmondtdaylor.co.uk/images/photo27.jpg>
- (i) identify the domain name [1 mark]
  - (ii) identify the file name. [1 mark]
- (b) (i) Describe **one** way a new company can register a new domain name. [2 marks]
- (ii) The domain name (<http://www.toysrus.com>) is held in a database on the Domain Name System (DNS) server as a unique IP address such as 192.16.172.12.
- Describe why a company would prefer to use a domain name for its web site rather than an IP address. [2 marks]
- (c) Explain **two** technical issues that must be addressed to enable a company to introduce teleworking for its employees. [4 marks]
- (d) To what extent has the change to teleworking been beneficial to both employers and employees? [10 marks]

## SECTION B

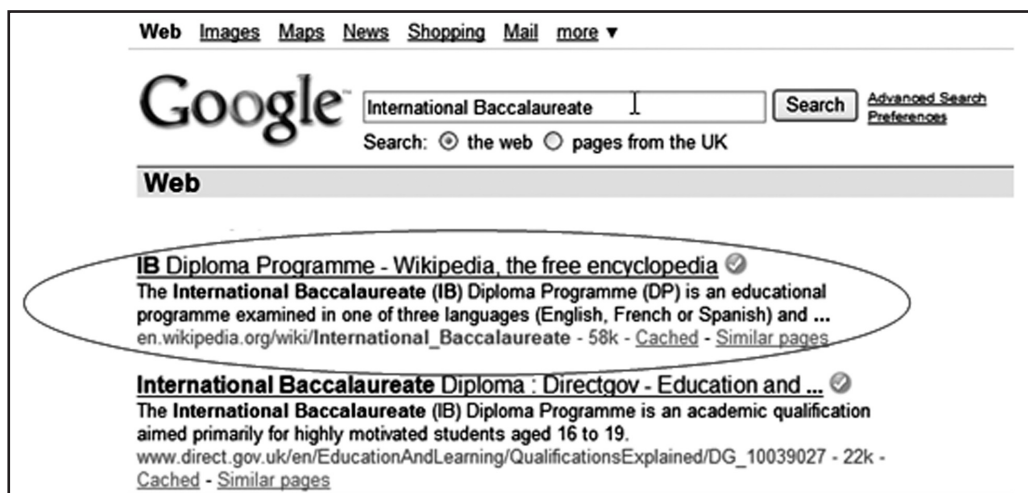
Answer **two** questions

### Area of impact: Education

2. *Wikipedia* is a multilingual, web-based, free content encyclopedia project. *Wikipedia*'s articles provide links to guide the user to related pages with additional information.

[Source: adapted from <http://en.wikipedia.org/wiki/Wikipedia:About>, 12 May 2009]

When people make enquiries on the World Wide Web using search engines, references to *Wikipedia* often appear towards the top of the list of results. If you type the words “International Baccalaureate” into the *Google* search engine, a *Wikipedia* reference appears very high up in the listings. However, if you type simply “IB”, information about the *International Baccalaureate* appears much further down the list.



[Source: <http://www.google.co.uk/>, 9 May 2009]

- (a) Define the term *search engine*. [2 marks]
- (b) Describe **two** ways in which search engines make decisions about the rank order of the links that they display in response to an enquiry. [4 marks]
- (c) Explain how students could carry out the most effective search for the *International Baccalaureate* using a search engine. [4 marks]
- (d) Some educational organizations have decided not to allow students to quote public information web sites such as *Wikipedia* as references for their research work. To what extent is this decision justified? [10 marks]

**Area of impact: Health**

3. Traditionally, video game consoles have been used primarily by children. In 2006, *Nintendo* expanded its market for the Wii video game console to include senior citizens. It has quickly become a popular form of mental and physical therapy in nursing homes across North America, Europe and Australia. Unlike some other video game consoles, users of the Wii system are required to perform physical movements, which are simulated by an action on the screen.



[Source: <http://vatwinvike.umwblogs.org/files/2008/11/wii1-300x276.jpg>, 29 May 2009]

In games such as *Wii Sports*, the Wii console uses sophisticated motion-sensing technology in its remotes to imitate real-life play. One of the distinguishing features of the console is its wireless controller, the “Wii Remote”, which can be used as a hand-held pointing device and can detect acceleration and movements.

- (a) Identify **two** limitations of the Wii as a simulation. [2 marks]
- (b) Describe **two** other potential uses of the technology incorporated within the Wii video game console. [4 marks]
- (c) Explain how **two** devices that are not physically connected can communicate with each other. [4 marks]
- (d) Evaluate the role of video game consoles in the healthcare of the elderly. [10 marks]

### Area of impact: Arts, entertainment and leisure

4. YouTube is one of the leaders in online video broadcasting. It enables millions of people to watch and share videos worldwide through the World Wide Web. It is possible to access video clips hosted on YouTube through web sites, mobile devices, blogs and e-mail. YouTube is empowering students to become the “broadcasters of tomorrow”.

To become a member and to be able to upload a video to YouTube, the following online form must be completed. One of the fields that must be entered is a captcha, which in this case is “unkatr” (see below). A database can be used to store information about videos that have been submitted and about members.

#### Create Your YouTube Account

It's free and easy. Just fill out the account info below. (All fields required)

Account Type: Standard

E-mail Address:

YouTube Username:

check

Your username can only contain letters A-Z or numbers 0-9

Password:

Confirm Password:

Country: Austria

Postcode:

Required for US, UK & Canada Only

Gender: ☐ Male ☐ Female

Date of Birth: -- -- -- -- -- --

Verification:

Enter the text in the image

unkatr

Can't read?

☒ - Sign me up for the "Broadcast Yourself" email
   
☒ - I agree to the [terms of use](#) and [privacy policy](#).

Sign Up

[Source: [http://www.youtube.com/create\\_account](http://www.youtube.com/create_account), 19 May 2007]

*(This question continues on the following page)*

*(Question 4 continued)*

- (a) Identify **two** kinds of information that are stored in an online video broadcasting database about each of the videos. *[2 marks]*
- (b) Describe **two** reasons why there is a requirement to use a captcha when setting up an account. *[4 marks]*
- (c) Explain **two** ways video services such as YouTube can ensure that the videos uploaded by members comply with copyright laws. *[4 marks]*
- (d) To what extent have web sites such as YouTube been used for more purposes than leisure and entertainment? *[10 marks]*

**Area of impact: Science and the environment**

5. The national DNA database for the United Kingdom (UK) currently contains the personal information and DNA data for approximately 4.5 million people. Each individual has a unique DNA code. Currently, DNA samples are only collected from people who are arrested by the police. The DNA data is permanently stored in the DNA database regardless of whether the individuals are found guilty of the crime or not.

This DNA database is already the largest relational database of this type in the world. The UK government now wants to expand the use of the DNA database by including the DNA data from all people living in the UK. This is controversial because it would also include collecting the DNA data from children at birth. Some government officials are concerned because they feel that this expansion would be undesirable and raise significant technical and ethical issues.

[Source: adapted from “*Nation of suspects*” *fear on DNA*, <http://news.bbc.co.uk/1/hi/uk/7261361.stm>, 24 February 2008]

- (a) Define the term *relational database*. [2 marks]
- (b) Describe the process of how a particular person’s DNA could be checked against data in the national DNA database to see if their DNA data has been stored. [4 marks]
- (c) Explain **two** security measures that would need to be implemented by a government before a national DNA database can be introduced. [4 marks]
- (d) Evaluate the possible impacts on UK citizens of collecting DNA data from children at birth. [10 marks]



**Area of impact: Politics and government**

6. Studies have been undertaken in the United States, Canada, The Netherlands, India, South Africa and Nigeria to determine whether electronic voting (e-voting) will increase participation at elections, particularly in the case of younger voters.

E-voting is only one method of voting, others include voting by mail and by phone. E-voting may be carried out either at home or in voting stations but could be subject to a wide variety of problems such as:

- network issues *e.g.* server failure or no internet connection
- software errors and hardware problems
- “foul play” *e.g.* hacking, tampering
- voting using a false identity
- the digital divide.

- (a) Identify **two** possible ways in which a person could cast an e-vote. *[2 marks]*
- (b) Describe **two** reasons why governments would encourage e-voting. *[4 marks]*
- (c) Explain **two** methods that governments can use to attempt to prevent people casting e-votes using a false identity. *[4 marks]*
- (d) Discuss policies and procedures that could be implemented in order to ensure the security and integrity of the votes before, during and after they have been cast. *[10 marks]*
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