



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

Tuesday 16 May 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

Answer *all* parts of the question.

World Wide Web Domains

1. The World Wide Web has changed the way many people use computers connected to the Internet to communicate, find information, conduct business and seek entertainment. Web servers provide special functions in formats that are easy to use and may host more than one domain. The growth and size of the World Wide Web are shown in the two tables below.

Table 1 World Wide Web size by selected domains and associated country populations. (The data is approximate as of February 1999 and has been rounded to the nearest thousand.)

Domain	Country	Population	Web Sites	People per Web site
.com	United States	–	3 009 000	
.net	United States	–	307 000	
.org	United States	–	248 000	
.edu	United States	–	5 000	
	United States (total of above)	270 312 000	3 569 000	76
.de	Germany	82 079 000	319 000	257
.uk	United Kingdom	58 970 000	195 000	302
.se	Sweden	8 887 000	55 000	162
.au	Australia	18 613 000	75 000	248
.dk	Denmark	5 334 000	75 000	71
.br	Brazil	169 807 000	60 000	2830
.nl	Netherlands	15 731 000	56 000	281
.jp	Japan	125 932 000	51 000	2469

Table 2 Number of World Wide Web hosts by year

Date	Number of Web Sites	Number of business (.com) sites	Web Sites per Web server
June 1993	130	2	13 000
December 1993	623	29	3475
June 1994	2738	370	1095
December 1994	10 022	1834	451
June 1995	23 500	7356	270
January 1996	100 000	50 000	94

- (a) Using the data in these tables, compare the use of the World Wide Web by people living in the countries with the largest populations and people living in the countries with the smallest populations. *[3 marks]*

- (b) Explain the social reasons why some countries have many Web sites. *[4 marks]*

- (c) Draw and label **one** graph showing the number of web sites for the period from June 1993 to January 1996 and the number of business (.com) sites for the same period. *[2 marks]*

- (d) List **four** specific business activities that can be conducted using the World Wide Web. *[4 marks]*

- (e) Discuss **three** ethical considerations or social responsibilities of people providing and maintaining a Web site. *[7 marks]*

SECTION B

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

2. Toy shops have become increasingly stocked with new electronic toys which boast a range of new technological features. A recent example is a furry, stuffed animal which is advertised to appeal to children aged 8 and up. It arrives speaking a nonsense language, but over time will learn to speak English. It will also respond with sound or speech to pats on the head, backstrokes, and being turned over. The responses are not predictable. If this stuffed animal is put into another room with the similar toy, they will begin to chat. This toy is also able to spontaneously wink its eye. The manufacturer claims that this is the first time that so many technologies have come together in one affordable toy.
- (a) Describe **two** information technology tools which have been incorporated into the toy. *[2 marks]*
 - (b) Explain **two** reasons why government agencies have forbidden employees from bringing this toy into government buildings. *[4 marks]*
 - (c) Discuss **four** ethical and/or social considerations which have been considered in the creation, distribution, and purchase of this toy. *[12 marks]*
3. Violations of copyright licences and widespread software piracy are serious problems for both software developers and businesses in some areas of the world.
- (a) Explain the difference between a violation of copyright licence and software piracy. *[2 marks]*
 - (b) Describe **two** ways in which pirated software can be distributed illegally. *[4 marks]*
 - (c) Discuss **four** policy practices which an institution or organisation could implement to prevent violations of copyright licences and software piracy. *[12 marks]*

4. Should we rely on computers? Predictions and conclusions about subjects of important social interest frequently appear in the news. These predictions and conclusions result from modelling and simulations which can process vast amounts of data and calculations. Some examples are: population growth, the effects of a tax cut on the economy, predictions of a big earthquake, the cost of proposed government programmes.
- (a) (i) Outline the difference between modelling and simulation. *[2 marks]*
- (ii) Describe an example of a situation in which a physical phenomenon is simulated and one in which a mathematical model is used to simulate an abstract system (other than the ones mentioned in the question). *[4 marks]*
- (b) Describe **two** situations in which creating a computer simulation would not be advisable. *[4 marks]*
- (c) Discuss **two** ethical considerations that arise when designing computer models and simulations. *[8 marks]*
5. Many IT developments have resulted from the merging of two or more technologies. For example, phones permitted people to communicate 1000 times faster than by sending written messages and computers let people compute and manipulate data 1000 times faster than by manual methods. When phones and computers were joined to create the Internet, there was a multiplier effect; people could then calculate, manipulate data, search for information, and exchange information a million times faster than by the old methods.
- (a) List **two** other IT developments that use at least two different IT technologies to give a specific service or to achieve a specific function. *[2 marks]*
- (b) Suggest **one** new IT development that might occur within the next ten years that will be made possible by the combining of two or more current IT technologies. *[4 marks]*
- (c) List **four** uses of computer chips in modern cars. *[4 marks]*
- (d) Discuss the ethical considerations that should be involved when a new technology is developed. *[8 marks]*
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