

MARKSCHEME

May 2000

INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

Standard Level

Paper 2

SECTION A

1. (a) **[1 mark]** for each observation (point) made up to a maximum of **[3 marks]**. The least populated country and most populated countries each have approximately the same small number of people per Web site. The next most populated country has most persons per Web site. Thus, there is not a corresponding increase in the number of Web sites as population increases. The use of the Web sites available within a country need not be a reflection of the in-country use; the Web is available world-wide and the sites may be used by persons not living within the country.
- (b) **[1 mark]** for each point up to a maximum of **[4 marks]**. Many Web sites per person can be a result of the average economic status of the population. It can mean that the country has a strong education programme to promote the use of the Web. It may mean that there are many financially strong companies available to provide Web site hosting. It may mean that there is little government regulation of the use of the web or of the sites provided. It may mean low cost and easy access to the Web.
- (c) **[1 mark]** for recognising the growth is not linear but is logarithmic (or geometric is acceptable). **[1 mark]** for recognising the rate of growth of business, commercial, or company (.com) sites has grown faster than the sites on other domains. Note: This data may also suggest a very rapid rate of growth in business sites in the United States that use .com.
- (d) **[1 mark]** for each **different** activity up to a maximum of **[4 marks]**. Buying products, banking (transferring funds, examining accounts), finding product information, buying and selling stocks and bonds, sending invoices, sending payment acknowledgements. Accept other specific business activities.
- (e) **[1 mark]** for each issue considered up to a maximum of **[3 marks]**, plus **[2 marks]** for the quality of construction and **[1 mark]** for weighing up.

Web site operators have a responsibility not to provide information that is offensive or harmful, especially to youth. Providers must assure that all business related sites have secure encryption of transmitted data. Providers must assure that all business related sites are reliable and operating (24 hours per day) to facilitate clients conducting business. Web site managers should assume responsibility for the accuracy and timeliness of data provided.

SECTION B

2. (a) *(Award [1 mark] each for any of the answers below up to [2 marks] maximum.)*

- artificial intelligence is used in learning English
- voice recognition
- digitised speech capability
- robotics for making winking motion
- sensing devices to detect if person is in the room
- sensing devices to detect if another toy is in the room

Reward other acceptable answers.

(b) *(Award [2 marks] each for any of the reasons below up to [4 marks] maximum.)*

- ruling that no recording devices are allowed in government security areas
- government is concerned that the toy can be used to record security information
- distraction while employees are working
- playing with the toy will detract from the amount of work which gets done

Reward other acceptable answers.

(c) *(Award up to [3 marks] for a full description of any four of the points below up to a maximum [12 marks].)*

(Award up to [2 marks] for quality of construction.)

- programmers must be ethical about what they programme into the toy
- toy manufacturer must advertise the toy accurately to the public and parents
- parents must make a value judgement about whether the toy is appropriate for their child
- child should inform his parents if anything about the toy's vocabulary or actions disturbs him
- sales of the toy produce great economic gain for the company
- the toy manufacturer has included many human-like qualities in the toy.

Reward other acceptable answers.

3. (a) *(Award [1 mark] each for any of the descriptions below up to [2 marks] maximum)*
- A violation of a copyright licence means that software has been purchased, but the conditions of use have not been followed.
 - Software piracy is the stealing of intellectual property by illegally copying, distributing or selling software.

- (b) *(Award [2 marks] each for any of the reasons below up to [4 marks] maximum)*

- Illegal sites on the Internet;
- From acquaintances or companies who have the software;
- Purchasing the product at a much reduced price from a disreputable company or store.

Reward other acceptable answers.

- (c) *(Award up to [2 marks] each for a full description of any of the points below up to a maximum [8 marks].)*

(Award up to [2 marks] for quality of construction.)

(Award up to [4 marks] for the weighing up the effectiveness of the policies.)

- Copyright agreements enclosed in all software packages must be observed
- No downloading of commercial software with known commercial value from the Internet
- Installation of company purchased software only allowed
- No home use of company software unless the licence allows for this installation
- Regular review of all software on computers within the institution or organisation
- Installation of software to monitor what applications have been installed on computers

Reward other acceptable answers.

4. (a) (i) *(Award [1 mark] for stating that the model is the description of conditions and [1 mark] for stating that simulation is the system/process to output a result on the model; up to [2 marks].)*

Modelling: description of an event, behaviour or condition in the real world.

Simulation: system that emulates by computer a real world condition and outputs the predicted results.

Conditions are described in models **or** Use of models that describe a real world condition to predict results.

- (ii) *(Award [2 marks] for each description of an example up to a maximum of [4 marks].)*

- physical system simulation
- design of a new car
- layout of a house
- flow of water in a river
- abstract system simulation
- cash flow
- demand behaviour in economics
- profit/loss in the stock exchange through a period.

Reward any other appropriate example.

- (b) *(Award [2 marks] per description of each situation up to [4 marks].)*

- If the simulation of the process takes more time than the actual process does.
- If the simulation of the process is more expensive than the expected results in terms of cost.

Reward any other appropriate suggestion.

- (c) *(Award up to [4 marks] for the full discussion of each ethical consideration, up to [8 marks]. If each ethical consideration is stated but not discussed award a maximum [1 mark] per consideration. Award up to [2 marks] for quality of construction.)*

- People may get hurt/affected because of inaccurate models caused by an incomplete knowledge of the system being modelled.
- People rely on computer results but they may be incomplete or inaccurate.
- Data used to model a situation may be manipulated for political/economical reasons.
- We may not have complete knowledge of the system modelled.

Reward any other appropriate example.

5. (a) *(Award [1 mark] each for any of the developments listed up to a maximum of [2 marks].)*

- cellular phones: radio or wireless communications and small digital phones
- home or office cordless phones: radio or wireless communications and small digital phones
- digital cameras: computer chips for processing images and light sensors to capture images
- security devices: motion or heat sensors and phone communications to notify police

Reward other acceptable answers.

(b) *(Award [2 marks] for naming the new IT development and one mark each, up to a maximum of [2 marks] for naming the current IT technologies.)*

- refrigerators or home food pantries (or closets) that will keep track of home food inventories and automatically order groceries when needed: phone communications, bar code scanners, computer chips with associated memory.
- small devices to attach to children that will use synthesised voice to give the child direction to return home if lost or called: GPS, voice synthesisers, wireless communications.

Reward other acceptable answers.

(c) *(Award [1 mark] each for any of the uses listed up to a maximum of [4 marks].)*

- ABS, automatic braking systems
- automatic speed controls
- automatic detection of light or darkness and adjustments of car lights
- GPS guidance systems
- fuel and air mixing for the engine
- monitoring of fuel consumption
- calculating the fuel and miles available to drive on the remaining fuel
- computing the estimated time of arrival at one's destination

Reward other acceptable answers.

(d) *(Award [2 marks] for each ethical issue identified up to a maximum of [2 marks].) ([3 marks] for the discussion of each issue up to a maximum of [6 marks]. If each ethical consideration is stated but not discussed award a maximum of [1 mark].) (Award up to [2 marks] for quality of construction.)*

- Who will benefit from the new technology?
- Who might be harmed by the new technology?
- Will its use be controlled by high costs and is that fair to the poor?
- Will the handicapped be able to use the new technology?
- Will jobs be lost, and if so, what steps are taken to retrain employees?
- What misuses might be made of the technology?

(Reward other acceptable answers.)
