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INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY
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PAPER 1

Monday 15 November 2010 (afternoon)

1 hour

Candidate session number

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INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all the questions in the spaces provided.

0109

1. *Microsoft* Windows was first introduced in 1985 as Windows 1.0. Windows 1.0 was a 16-bit graphical operating environment. This was the first attempt by *Microsoft* to implement a multitasking operating system with a graphical user interface (GUI) on the personal computer (PC) platform. Windows has since become the dominant operating system for PCs.

The following table shows some of the changes in system requirements as Windows has developed (some variation according to version).

Version	Date introduced	RAM required	Secondary storage required
1.0	1985	256 KB	2 floppy disks or 1 hard disk
2.10	1988	512 KB	1 floppy disk and 1 hard disk
3.10	1992	1 MB	6.5 MB
95	1995	4 MB	50 MB
98	1998	16 MB	255 MB
2000	2000	32 MB	700 MB
XP	2001	128 MB	1.5 GB
Vista	2007	512 MB	15 GB

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

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(This question continues on the following page)

(Question 1 continued)

(b) Identify **four** reasons why Windows has required increasing amounts of system resources as it has been developed. *[4 marks]*

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(c) A company is considering changing the operating system that it uses on its PCs to Linux, which is free open source software*. Explain reasons why a company might choose to pay for commercial software rather than obtain it free. *[4 marks]*

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* open source software: software that can be freely distributed and modified by users

2. Keystroke logging (often called keylogging) is a method of capturing and recording user keystrokes. Keyloggers are widely available on the Internet.

There are currently two types of keylogging methods:

- Hardware keyloggers are used for keylogging by means of a hardware device that is attached between the computer keyboard and the computer. This device logs all keyboard activity to its internal memory.

- Software keyloggers work in the background and can either store the keystrokes (actions of the user) or transmit them to be accessed remotely.

Keylogging software is often installed deliberately by the owner of a computer system, or it may enter a system by means of a Trojan horse.

[Source: adapted from http://en.wikipedia.org/wiki/Keystroke_logging]

(a) With reference to a computer system, define the term *Trojan horse*. *[2 marks]*

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(Question 2 continued)

(b) Describe **two** ways in which keylogging software could make its logged data available to a remotely located observer. *[4 marks]*

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(c) Explain **two** reasons why a network administrator might install a keylogger. *[4 marks]*

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3. A relational database is used to record information about hotel bookings. The data table below shows some records from the table RESERVATIONS.

fore_name	last_name	telephone	e-mail	date_of_arrival	room_number	number_nights
Tyler	Rodriguez	1 89 121 1990-3131	mauris.id.sapien@ultriciessem.ca	11.01.09	151	2
Tyler	Rodriguez	1 72 743 3820-6209	phasellus.at@feugiatplaceratvelit.edu	10.02.09	188	6
Lacey	Garcia	1 31 890 9128-8562	vulputate.nisi.sem@dolor.ca	08.02.09	383	4
Angela	Mullins	1 82 614 8701-0299	vulputate@nisi.ca	25.01.09	487	1
Ivy	Conley	1 93 303 9336-1513	dui@malesuada.edu	19.01.09	134	3
Ivy	Conley	1 69 307 2123-0560	dictum.magna.ut@atvelit.edu	27.05.09	354	8
Hanae	Wiggins	1 93 193 2241-8348	justo@montesnasceturridiculus.ca	15.09.09	113	9
Maggie	Brooks	1 82 604 2881-7127	volutpat.ornare@acmattisornare.org	24.05.09	407	3
Velma	Morrison	1 45 675 7617-4334	dictum.malesuada@ullamcorper.org	13.03.09	122	8
Vanna	Rivas	1 32 727 5461-8275	enim.nec.tempus@mattis.com	15.02.09	343	4

(a) (i) A query is applied to the data shown in the table above using the following condition:

date_of_arrival>24.05.09 **AND** number_nights=8

Identify the number of records generated as a result of this query. *[1 mark]*

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(ii) A query is applied to the data shown in the table above using the following condition:

date_of_arrival>24.05.09 **OR** number_nights=8

Identify the number of records generated as a result of this query. *[1 mark]*

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(This question continues on the following page)

(Question 3 continued)

(b) Describe **two** ways in which each record in the data table on the previous page could be uniquely identified. *[4 marks]*

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(c) Many booking agencies can access the hotel bookings database simultaneously. Explain how the integrity **and** the security of the data can be maintained. *[4 marks]*

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4. It is possible to produce a computer model of snowfall that will enable Image 1 to be transformed into Image 2. This model takes into account many variables, such as wind speed, in order to predict the appearance of the landscape. This model can be used to produce realistic computer graphics which can be incorporated into an animated movie. This model has been programmed so that it can be run more than once, or stopped at different stages to create images with varying amounts of snow.

Image 1

Image 2

[Used with the permission of Paul Fearing, alumnus of Computer Science department at University of British Columbia.]

(a) Define the term *computer model*. *[2 marks]*

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(This question continues on the following page)

(Question 4 continued)

(b) A student wishes to create an animated movie that starts with Image 1 and ends with Image 2.

Describe the processes by which this computer model can be used to generate a sequence of images to create an animated movie. *[4 marks]*

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(c) Explain **two** factors that would contribute to the accuracy of this computer model. *[4 marks]*

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