UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

7010 COMPUTER STUDIES

7010/12 Paper 1, maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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1 (a) Any **two** from:
- data must be up-to-date
- data can only be read/used for the purpose for which it was collected
- data must be accurate/relevant
- data must be deleted/destroyed when no longer needed/don't keep longer than necessary
- data must be secure
- data user must register (what data is held)
- data must be used/collected fairly and lawfully
- data must be protected from accidental damage
- only authorised people can have access to the data
- fines will be imposed for data mis-use
- data should not be passed on to 3rd parties without owner's permission
- person can view data and have it changed if necessary
- safe harbour [2]

(b) Any **two** from:
- risk of viruses
- risk of hacking still exists
- (physical) corruption of data (e.g. by using incorrect shutdown procedure)
- theft/loss of CDs/DVDs/memory sticks containing information
- data protection act doesn't protect the data itself [2]

2 (a) Any **one** from:
- helps users to understand how to use the software package
- instructions on how to operate the system [1]

Don't credit candidates who rewrite the question

(b) Any **three** from:
- how to run/load/install the software package
- how to save a file
- how to search for information
- how to sort the data
- how to print out documents
- how to add/delete/amend records
- purpose of the system/programs/software
- (input) screen layout
- (output) print layouts
- hardware requirements
- software requirements
- sample runs
- error handling/meaning of error messages
- troubleshooting guide
- how to log in/out/shutdown/startup
- tutorials
- backup
- input methods

NOT help [3]

(c) (i) Any **one** from:
- can ask a team of experts about the problem directly/expand on questions
- links built into the software
- useful if user doesn't understand problem/has no IT or computing skills
- no need to print out large user manuals (saves money)
- much easier to update if changes made to software
- more customer friendly (leads to repeat business) [1]

(ii) Any **one** from:
- only available when connected to the Internet
- may take a while to get a response to their query [1]

3 (a) Any **one** advantage of CLI from:
- direct communication with computer system
- not restricted to a number of pre-determined options
- simple interface using keyboard only
- faster response

Any **one** disadvantage of CLI from:
- need to learn a number of/long/complex commands
- need to type in the commands (possibility of errors)
- slow having to type in commands every time

Any **one** advantage of GUI from:
- only need to click on one simple picture
- so much easier for the novice
- several instructions are replaced by one icon
- no need to understand how computer systems work

Any **one** disadvantage of GUI from:
- wasteful of computer memory
- if user wants to communicate with computer system directly, GUI is effectively more complex. [4]

(b) Any **three** from:
- handling interrupts
- input/output/peripheral/device control
- spooling
- multitasking/JCL/batch processing
- multiprogramming
- user interface
- load/run software
- processor management/task management
- file (copy/save/delete etc) management
- memory management
- user accounts
- utility tasks (defrag, format etc.)
- error handling
- security management
- power management [3]

4 **(a)** Any **two** from:
- access to undesirable websites
- increased risk of hacking
- greater volume of junk mail
- theft of computer time by staff (using the internet instead of working e.g. downloading games)
- increased risk of viruses and other security issues [2]

(b) Any **two** from:
- can set up specific information pages
- can limit places where the intranet can be accessed
- better security since network is internal/LAN
- faster to find information since it is restricted to company info only

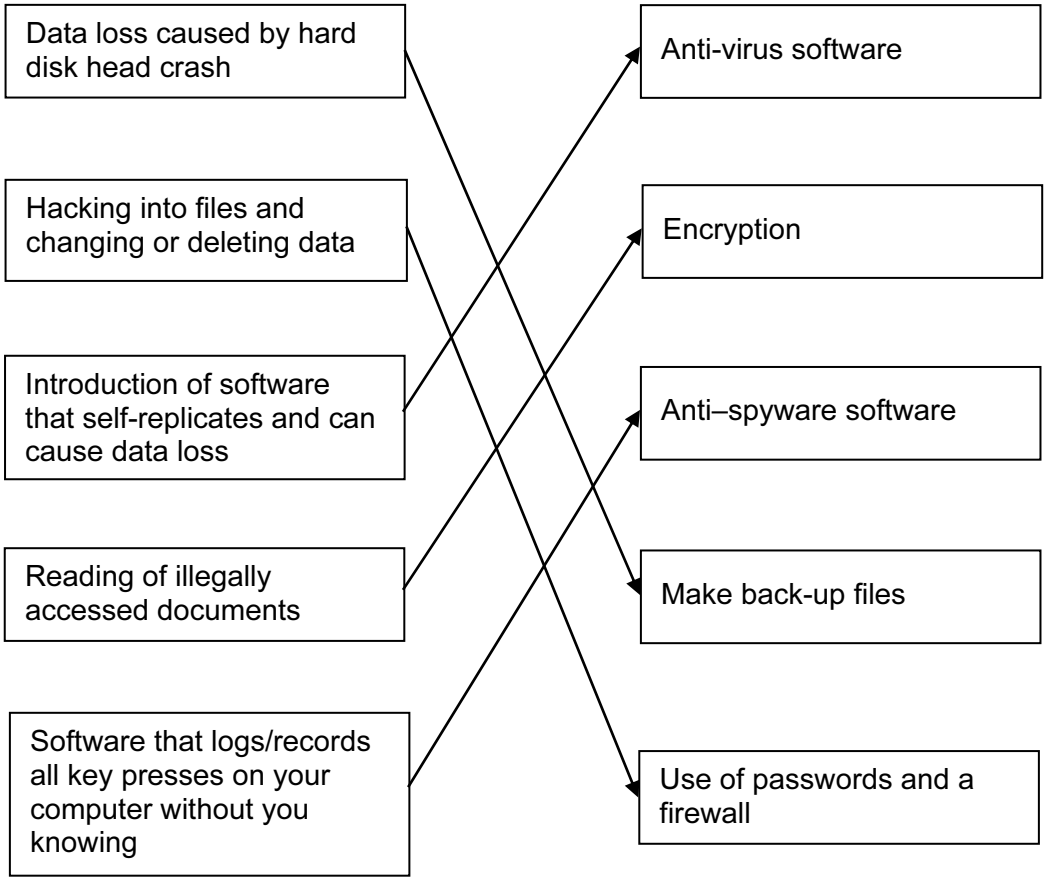
No Internet based answers. [2]

5

Application	Input Device	Reason for choice of device
Virtual reality application	– data gloves – data goggles – sensor suits	– allows user to interact with v/r system directly – system needs to get data directly from its surroundings
Disabled person communicating with a computer system	– microphone – head wand – large keyboard	– allows blind person to dictate text directly to the computer – if little hand movement, allows user to select options from the screen – people with poor eye sight can use the keyboard to input text
Automatic stock control system at a supermarket	– bar code reader – RFID tag reader	– **automatically** reads data – **fewer data entry errors**
Information kiosk at an airport using a GUI interface	– touch screen – trackerball	– easier for the customers – reduces the number of possible options for the user – select options from a screen – immovable/more secure

May see other devices .e.g. Kimball tag reader
NOT mouse, NOT keyboard [8]

6 1 mark per correct link



[5]

7 **(a)** 1 mark for each error identified + suggested correction

line 5: this should read ***if x > h then h = x***

line 7: ***print h*** should come after the end of the repeat loop

line 8: this should read ***until c = 20*** or ***until c >= 20*** or ***until c > 19*** [3]

(b) Any **two** from:
- close to English
- one statement is equal to many low-level language statements
- portable
- easy to edit/debug/update
- problem oriented
- needs converting to machine code before execution [2]

(c) Any **one** from:
- interpreter – runs line by line and locates errors as it runs
- compiler – converts whole program into object code/gives complete list of errors [1]

8 (a) (i) drop down menu/list / combobox

(ii) Any **one** from:
- can limit number of choices
- allows only specific answers to be given
- fast way of choosing options
- reduces chances of any errors [2]

(b) (i) Any **one** from:
- length check
- character/type check
- presence check
- format check

NOT range check. [1]

(ii) 1 mark for each type of test data + 1 mark for an example:
Normal data:
- input ID with 9 characters e.g. 123456789 or abc456789

Erroneous/abnormal data:
- input number with digits missing e.g. 123 789

Example must match (i) [4]

9 (a) Any **one** from:
- takes up much less memory space/smaller file size
- faster download time
- MP3 track 1/10th the size of a CD track [1]

(b) 1 mark for showing relevant working + 1 mark for correct answer

40 tracks = 40 x 3.5 = 1 40 Mbyte
56 megabits/sec = 7 Mbyte/sec
time to download tracks = 140/7

i.e. **20 seconds** [2]

(c) 1 mark for showing relevant working + 1 mark for correct answer

36 photos = 36 x 1.8 = 64.8 Mbyte
16 megabits/sec = 2 Mbyte/sec
time to upload photos = 64.8/2

i.e. **32.4 secs** [2]

10 (a)

N	sum	x	count	T	average
0	0	0	1		
	5	1	2	5	
	16	2	3	11	
	32	3	4	16	
1	28	4	5	–4	
2	18	5	6	–10	
	26	6	7	8	
	36	7	8	10	
3	33	8	9	–3	
	50	9	10	17	
	60	10	11	10	
					6

1 mark 1 mark 1 mark 1 mark 1 mark 1 mark [6]

(b) 6, 3 [1]

11 (a) (i)

A	B	C	
0	*0*	**0**	} 1 mark
0	*1*	**1**	
1	*0*	**1**	} 1 mark
1	*1*	**1**	

[2]

(ii) OR gate [1]

(b) (i)

A	B	C	
0	*0*	**0**	} 1 mark
0	*1*	**0**	
1	*0*	**0**	} 1 mark
1	*1*	**1**	

[2]

(ii) AND gate [1]

12 (a) Any **three** from:
- sensors detect magnets
- send signals to the computer
- signals changed to digital using ADC
- computer checks all previous positions ...
- ... which are stored in memory/on file
- and determines which piece has moved [3]

(b) Any **two** from:
- legal/acceptable moves stored in memory/on file
- computer can calculate which squares the piece is allowed to move to
- computer tracks each move made by each piece
- compare actual move with permissible move [2]

(c) – expert system/Artificial Intelligence [1]

13 Any **three advantages** from:
- can shop 24–7/in own time
- worldwide therefore greater choice
- no need to waste money on travelling to shops
- no need to waste time travelling
- disabled/elderly people don't have to leave their homes
- cost savings often passed on to customer
- can look for "best value" in a short time
- less pollution since fewer car journeys

Any **two disadvantages** from:
- shops close down in cities/unemployment/"ghost towns"
- increased risk of fraud/hacking
- less social interaction between people
- can't see the goods first
- goods may not arrive/"bogus" web sites
- environmental issues/wasted packaging
- "ties up" the phone line if broadband not available
- increase in phone bills [5]

14 (a) 1 mark for correct formula in D2 and 1 mark for correct replication

	D
1	**scale length (m)**
2	= B2/C2
3	= B3/C3
4	= B4/C4
5	= B5/C5
6	= B6/C6
7	= B7/C7
8	

[2]

(b) (i) Y [1]

(ii) = IF (D7 > 0.25, "Y", "N") [1]

(c) Any **two** from:
- select cell (e.g. C1)
- select DATA and choose FILTER (autofilter)
- choose 18 on drop down box
- only rows where 18th scale models will show
- draw bar chart using column C
- colour bars differently where scale = 18
- conditional formatting
- colour cells differently where scale = 18 [2]

15 1 mark for **each** storage method + appropriate example
- magnetic
  - e.g. floppy disk, hard disk, magnetic tape
- optical
  - e.g. CD, DVD, Blu-ray etc
- solid state
  - e.g. flash memory [3]

16 (a) (i) Barcode

(ii) Any **two** from:
- a book is republished
- new copies of book arrive
- new books published (new titles)
- errors in one of the fields
- book is sold/removed from stock [3]

(b) (i) Any **one** from:
- computer re-calculates check digit
- compares it to check digit in data sent

(ii) Any **one** from:
- missing digit (e.g. 3156 instead of 31516)
- transposed digit (e.g. 35116 instead of 31516)
- erroneous digit (e.g. 33516 instead of 31516) [2]

(c) Book title:
- character/type check
- presence check

Copies:
- range check
- character/type check
- length check
- presence check

Publication date:
- range check
- format check
- presence check

All checks must be different. [3]

17 (a) marking points

Initialisation	1 mark
loop control	1 mark
input student id	1 mark
input start and leaving dates	1 mark
check if leaving date <(=) starting date// check if starting date >(=) leaving date	1 mark
increment error total	1 mark
output error total	1 mark

sample algorithm

```
total = 0                                                          (1)
for x = 1 to 1800                                                  (1)
    input student_id                                               (1)
    input start_date, leaving_date                                 (1)
    if leaving_date <= start_date then total = total + 1           (2)
next x
print total                                                        (1)
```

Initialisation must be for the error counter. Inputs must be inside the loop, output must be outside the loop. [5]

(b) normal data that will be accepted:
– e.g. 110906 and 220710 or 060911 and 100722

abnormal data that should be rejected:
– e.g. 150911 and 201009 or 110915 and 091020

negative numbers that should be rejected:
– e.g. –110209 or –090211

month/day/year out of range that should be rejected:
– e.g. 352210 or 102235

use of text that should be rejected:
– e.g. September 15, 2010 or 15th September 2010

Marks are for examples and a brief description. Must have both description and example for each mark.