

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

General Certificate of Education Ordinary Level

**MARK SCHEME for the June 2005 question paper**

**7010 COMPUTER STUDIES**

**7010/01**

**Paper 1, maximum raw mark 100**

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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June 2005

GCE ORDINARY LEVEL

MARKING SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 7010/01

COMPUTER STUDIES  
Paper 1



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1 Generally, 1 mark for each valid point. Two examples gain 2 marks.

(a) *buffer*  
temporary  
storage area/memory  
to compensate for speed difference of device with CPU  
for data being transferred between components of a computer system  
allows other functions to take place while waiting  
e.g. printer, keyboard, disk drive [2]

(b) *gateway*  
link between systems  
that uses telecommunications/telephones  
and converts data passing through  
allows a computer in a LAN to communicate with a computer in a WAN  
device/software translates – between a LAN and a WAN or another LAN [2]

(c) *validation*  
check  
on data input  
detect any data that is incomplete/unreasonable or mistyped  
e.g. type, format, range, length, presence, control total, check digit [2]

(d) *polling*  
testing a station/terminal/device in a multi-access system  
in a sequential order/in turn  
to establish whether it is holding data for transmission/collection  
to allow time sharing  
e.g. checking source of interrupt [2]

(e) *data-logging*  
automatic capturing/sampling/gathering  
and storing of data readings/to be processed later  
from sensors  
over a period of time  
e.g. weather forecasting, temperature, rainfall, wind speed, wind  
direction, pressure, CO<sub>2</sub> [2]

2 Any **three** from for example:

input control  
output control  
controls hardware and software  
displays error messages  
deals with errors  
file management e.g. directories  
memory management  
handling interrupts  
multitasking  
communicating directly with the user/user interface  
checking passwords/codes  
handles security  
run utility tasks  
load/run/save/sort/rename/copy/list programs  
user accounts  
scheduling  
handles JCL/batch processing [3]

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**3** Award 1 mark each:

(a) legal right – right to view/check/change/correct data [1]

(b) software method – checking passwords/codes/fingerprints/  
retina scans/biometric devices  
encryption of data  
firewalls  
install dial back [1]

(c) hardware method – lock keyboard/computer/doors  
use memory sticks/removable drive/external hard  
drive [1]

**4** (a) Award 1 mark each from:

input – light/infra red signal  
PIR sensors/motion/movement  
pressure/button pressed e.g. zoom/flash  
battery level  
distance

processing – e.g. calculate light level  
adjust shutter speed/decide resolution  
adjust aperture  
operate flash  
calculate focus point  
name/save file  
adjust white balance  
add date/time [3]

(b) Award 1 mark for each reason:

no processing/no darkroom/no posting/no expensive paper/no need to print  
direct transfer to a computer/flash path/no scanning  
extra copies anytime  
can delete unwanted photographs immediately  
no cost of film/no need to buy a film [2]

**5** (a) 10 [1]

(b) Two points from:

fewer errors on input  
less storage space required/less memory  
easier/quicker to input  
quicker to find/search/easier to locate  
easier/faster validation [2]

(c) number/numeric/decimal/1 d.p. [1]

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- (d) **One** point from:  
 faster process/easier to program  
 updated/new records will occupy the same space as the old records  
 allows accurate estimation of storage required [1]
- (e) L807, L808 or 807, 808  
 1 mark each (minus 1 mark each error) [2]
- (f) (IN STOCK <16) AND (PRICE (\$) > 100)  
 or  
 (IN STOCK <= 15) AND (PRICE (\$) > 100)  
 1 mark 1 mark 1 mark
- NOTE: ignore case  
 16/15 and 100/101 award the mark with or without speech marks [3]
- (g) Award 1 mark for the correct field and 1 mark for the reason:  
 field – STOCK NO  
 reason – unique/primary key/key [2]
- 6 (a) Award 1 mark for one correct cell (mark first answer only):  
 A1:F1 / A3 / A5:F5 / A7:A11 / A13 / E14 / B4:D4 [1]
- (b) Award 1 mark for one from (or equivalent formula):  
 $\$B\$3 * E7 / B3 * E7 / E7*100$   
 $SUM(B7 : D7) * 100 / SUM(B7 : D7) * \$B\$3$   
 $(B7+C7+D7)*100 / (B7+C7+D7)*B3$  [1]
- (c) Award 1 mark for each stage:  
 highlight/click–on/right–click  
 copy and paste into C13, to D13 and E13  
 or a description of replication/fill right/drag and drop [2]
- (d) **Two** points from:  
 A5 and E5  
 (A7:A11)/(A5:A11)  
 (E7:E11)/(E5:E11) [2]
- (e)(i) Award 1 mark for each stage:  
 highlight/select (A7 : F11)/click on rows 7 to 11  
 select sort in the Data menu/ZtoA  
 select column F and descending [2]
- (ii) Palace, Oriental, Orchard, Grande, Beach (in this order)  
 minus 1 mark each error  
 Two adjacent errors lose 1 mark [2]

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7 Any **three** ways of detection from:

police central computer holds details of all crimes committed  
 police central computer holds details of criminals  
 police national criminal intelligence system can interact with data supplied by  
     Interpol, tax offices, banks, customs  
 evidence from speed cameras as it happens  
 evidence from security cameras/CCTV  
 use of on–line burglar/alarm systems  
 recovery of evidence from hard drives e.g. hacking, illicit sites  
 DNA profiling  
 use of false website  
 fingerprinting systems  
 electronic tagging  
 number plate recognition  
 biometric tagging  
 facial comparisons

[3]

8 (a) heater on and motor on/hot wash

[1]

(b)

8	7	6	5	4	3	2	1
0	0	0	1	0	0	0	0

[1]

(c) Any **one** from:

release door – via door switch  
 releasing powder at set intervals/fabric conditioner  
 drying/spinning  
 give error messages/beeps  
 stored programs for different washes e.g. cottons/woollens

[1]

9 (a) Any **three** from:

biometric data e.g. retina scan, fingerprints  
 PIN code/ID code  
 bank details e.g. account number, sort code  
 holders card limit  
 record of transactions made within this limit

[3]

(b) Any **two** from:

high cost of replacing the cards/advertising  
 ATMs need converting to read smart cards  
 POS terminal needs converting to read smart cards

[2]

(c) Any **two** from:

electronic purse – put money on and spend up to that amount  
 mobile phones – user can identify him/herself and their payments  
 store medical information e.g. blood group, allergies, medication  
 identification card/door locks/clocking in and out  
 a debit card/get cash at till

[2]

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- 10 (a)** Award 1 mark each for two advantages and one disadvantage:
- advantage – huge amount of information/wider variety  
information is continually updated  
make finding information easier/quicker
- disadvantage– could get virus and crash system  
need to know how to perform searches/be trained  
search could result in illicit data  
information is not always reliable/too much **[3]**
- (b)** Two points from:
- faster download/access/exchange of info  
ideal for watching/streaming video  
always on – do not have to wait for system to dial up  
not metered  
can use phone while surfing – only one line needed **[2]**
- (c)** Award 1 mark for a benefit and 1 mark for a disadvantage:
- benefit – no/less cables  
more people can use wireless network than wired one  
person can sit anywhere in the library/move around
- disadvantage – fewer wireless devices can be connected  
slower transmission speed (than wired)  
can have signal blocks e.g. metal cabinets  
limited range (wired does not have a limited range) **[2]**
- (d)** DVD/Zip disk/CDR/CD/flash disk/memory stick/portable hard drive **[1]**
- (e)** Two from – award 1 mark for each precaution they should take:
- Screen – sunlight not reflecting on the screen  
Monitor– with low resolution emission/screen filter/larger  
Chairs– adjustable for support  
Keyboards – ergonomically designed to stop RSI  
Cables – should not trail the floor  
Workstation and environment are checked for safety  
Take rests/breaks  
Block/Filtering sites/Nanny software **[2]**
- 11 (a)** Award 1 mark for the hardware and 1 mark for the way it helps:
- Hardware – large tracker ball  
touch pad/screen  
concept keyboard  
Braille keyboard  
mouth pen  
microphone  
head switches  
speaker
- Way – appropriate for deaf/dumb/blind/limited – movement/  
speech/hearing **[2]**

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**(b)** Award **1** mark for the software and **1** mark for the way it helps:

Software – voice recognition/synthesis  
special word processing program/predictive testing

Way – appropriate for deaf/dumb/blind/limited movement identified,  
e.g. voice recognition– converts speech to text/commands  
voice synthesis – gives on–screen feedback on loudness,  
pitch and timing  
word processing – completes words when first few letters  
typed  
braille output

**[2]**

**12 (a)** Any **two** items from:

costs/running costs/development costs  
benefits/improved management/better service  
whether proposed system will meet its objectives/future updates if any  
redundancy/training needs

**[2]**

**(b)** Any **two** from:

observation  
questionnaires  
interviews/talking to staff  
reading documents/manuals

**[2]**

**(c)** Any **one** from:

results from new system can be checked against known results  
errors/problems can be sorted out since there is a duplicate system  
less risk/have a fallback

**[1]**

**(d)** Award **1** mark each for a user and a technical documentation:

user documentation – running the system/starting up  
installing software  
identifying and correcting errors  
screen shots/sample screens  
hardware required

technical documentation – program listing  
list of variables  
program flowchart/algorithms/pseudo code  
systems flowchart  
data flow diagrams  
hierarchical charts  
file structure  
systems maintenance/upgrades  
troubleshooting/correcting errors

**[2]**



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- 13 (a)** Award 1 mark each for trace and reason:  
 trace – 3,5,7,9,11.....  
 reason – x is odd/loop does not terminate/goes on forever [2]
- (b)** Award 1 mark for the following stages:  
 initialise  
 loop  
 use of  $x = x + 2$   
 output of x [3]
- 14 (a)** Any **one** type of program:  
 games  
 operating systems  
 utility programs  
 compilers/assemblers/interpreters  
 virus [1]
- (b)** Any **one** reason:  
 faster execution/run/conversion  
 high level languages are too slow  
 assembly language instructions are closely tied with the particular  
 make/model of computer [1]
- 15** Any **one** application and reason award 1 mark each:  
 application e.g.  
 booking systems  
 stock control/stock market  
 on-board systems in planes that show height speed etc.  
 process control systems  
 interactive processing – inquiries, availability  
 transaction processing  
 reason – immediate update/processing [2]
- 16 (a)** Any **one** from:  
 manual had huge amounts of paper files/computerised less space  
 manual very slow searching for information/computerised faster  
 computerised system reduces errors  
 needed to reduce staff/costs  
 multi-access to data [1]
- (b)** random/direct/online [1]

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(c) Any **one** insertion from:

new patient  
new baby born

Any **one** amendment from:

new/change of treatment or medicine  
patient dies  
change of name/details  
error in data

[2]

(d) Any **two** from:

use hot standby computer  
use mirrored hard disk  
use backups  
re-run old master file with transaction file  
use regular dumps of files/copy of files on  
CD/tape streamer/file generations

[2]

(e) Any **two** tasks from:

monitoring patient conditions  
room occupancy/usage  
payroll/employee records  
expert system to diagnose illnesses  
staff training/virtual reality  
stock control/drugs in pharmacy  
air conditioning

[2]

17 Award **1** mark for each correct step in the algorithm:

Initialise  
Loop  
Input marks (x25)  
Match mark to grade (If..Then..Else or Case ) one correct  
Increment grade total  
Output the number of distinction, merit, pass and fail grades given

[6]