

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*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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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, CO₂ [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]