UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MARK SCHEME for the June 2005 question paper

0420 COMPUTER STUDIES

0420/01 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.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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Grade thresholds for Syllabus 0420 (Computer Studies) in the June 2005 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	100	66	46	26	21

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

June 2005

IGCSE

MARK SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 0420/01

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_2 **[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]**

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]**

(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):

B3 * E7 / B3 * E7 / E7*100
SUM(B7 : D7) * 100 / SUM(B7 : D7) * B3
(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]**

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]**

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]**

(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]**

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]**

(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]**