

**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*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the June 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

**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**

Page 1	Mark Scheme	Syllabus	
	IGCSE– JUNE 2005	0420	

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]

Page 2	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

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]

Page 3	Mark Scheme	Syllabus	
	IGCSE– JUNE 2005	0420	

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]

Page 4	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

- 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]

Page 5	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

- 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]



Page 6	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

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

(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]

Page 7	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

- 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]**

Page 8	Mark Scheme	Syllabus	
	IGCSE– JUNE 2005	0420	

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]

Page 9	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

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]

Page 10	Mark Scheme	Syllabus	
	IGCSE– JUNE 2005	0420	

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]

Page 11	Mark Scheme	Syllabus
	IGCSE– JUNE 2005	0420

- 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]