

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

International General Certificate of Secondary Education

**MARK SCHEME for the June 2004 question papers**

**0420 COMPUTER STUDIES**

**0420/01**

**Paper 1, maximum raw mark 100**

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do 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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**Grade thresholds** taken for Syllabus 0420 (Computer Studies) in the June 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	100	68	50	27	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 2004

INTERNATIONAL GCSE

MARKING SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 0420/01

COMPUTER STUDIES  
Paper 1



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

1 Generally, **one** mark for each valid point. Two examples gain two marks.

**(a) byte**

fixed number of bits, 8 bits  
represents a character

e.g.

a hex example

or

1	1	0	1	0	0	0	0	1
---	---	---	---	---	---	---	---	---

[2]

**(b) compiler**

program

converts/changes/translates high-level language into machine code/machine language/low level language/object code

changes each high-level language instruction into machine code instructions

produces independent program capable of being executed by itself

all (syntax errors) listed

converts whole program before execution/in one go

converts source code to object code

[2]

**(c) handshaking**

exchanging of signals

to establish communication

between two devices/computers

e.g. printer and computer, modem and computer

[2]

**(d) technical documentation**

documentation to ensure that the system can be maintained/updated/altered/  
developed/upgraded

trouble shooting/correcting errors/correcting faults

explanation of what the program does/how the system works

contains file structures

algorithms/flow charts/pseudo code

program listings

hierarchical charts

[2]

**(e) simulation**

studying the behavior of a system

by using a model/represents real-life/mathematical representation

e.g. flight simulator (or others), hazardous applications

results can be predicted

[2]

Page 2	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

2 (a) Any **one** method of transmission **AND** device

method of transmission e.g.

blue tooth	radio
optical	satellite
infra-red	microwave

device e.g.

3G (WAP) mobile phones/mobile phones/cell phone/remote  
key pad/remote control/keyboard  
infra-red mouse  
multimedia mobile handsets/notebooks  
GPRS (general packet radio service) mobiles  
WLAN(or WiFi) hotspots sited in public areas - e.g. coffee  
shops, railway stations, airports, motorway services  
linked printers  
PDA's (personal digital assistants)  
GPS

[1]

(b) Any **one** advantage (advantage need not be linked to (a)) e.g.

no wires  
fast/high speed wireless Internet access  
WLAN is faster than a modem or mobile  
WLAN for working at home one day a week/teleworkers  
see internet content away on the move  
create and send multimedia messages to mobiles or e-mail  
picture messaging - send photos/pictures text/sound/recorded  
greetings from mobiles to mobiles/PCs  
instant transmission - no busy signals/no searching for phone jacks  
download e-mail and file attachments on mobile  
watch live web cast on mobile/hotspot  
listen to streaming video on mobile/hotspot  
news/weather/sport/games while on the move  
access information from mobile anytime  
send/receive/delete e-mail while on the move  
wireless Inbox on mobile - to contacts and calendar  
view business appointments while out of office on mobile  
send corporate e-mail while out of office - even behind a firewall on mobile  
wireless internet connection from chat rooms for discussions with  
colleagues while on the move  
give visual demonstrations from mobile and colleagues watch back at  
the office

Any **one** disadvantage e.g.

WLAN speeds are slower than Net access at work/narrow band width  
any one within the WLAN nodes range with an appropriate device can  
use your WLAN and broad band link  
any one who walks past your house or WLAN linked into a corporate  
system can access sensitive information or credit card details  
3G phones not compatible with 2G phones  
Blue tooth - has limited range  
blocked signal/distorted signal/weak signal/lag  
health problems from microwaves

[2]

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

**3 (a) Two PLACES** from e.g.

car factories/factories  
chemical/nuclear factories  
production lines  
warehouses  
deep in the ocean/down mines  
on other planets/in space  
road junctions [2]

**(b) Two** from

reduced labour costs/do not need paying  
reduced cost of goods  
improve speed of production/productivity  
high degree of accuracy/precision/less errors  
can operate where humans can not go  
do not take breaks/holidays/get tired  
work 24 hrs a day  
reduce accidents at traffic lights  
improve traffic flow  
can work in dangerous conditions [2]

**4 (a) Any two** from e.g.

memory used up/slows down computer/alters setting/systems failure  
erases files/erases data/corrupts data/data needs restoring  
infects other computers on network  
production loss/financial loss [2]

**(b) Any two** from

do not allow outside floppy disks/CD's/DVD's  
use disk free work stations  
download/install and use anti virus software  
scan hard disks regularly  
update the anti virus program regularly  
do not open file attachments from unknown sources/download  
doubtful software from the Internet  
do not use files that come from unknown sources  
buy original software/do not buy pirated software  
use firewalls [2]

**5 Any three** points from e.g.

novice can use the system right away  
user-friendly/easy to select  
click on icons/picture to select  
easier to input/words are replaced with icons  
no need to know command language to use the system/remember  
command language  
selecting item using mouse is faster than entering commands  
avoids typing errors  
no need to type  
no need to remember commands  
no need know the different commands for the different software  
multitasking (several programs open at the same time therefore easier  
/faster to switch  
easier/faster switching between files, folders etc. [3]

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

6 (a) **One** item from e.g.

camera	microwave	
washing machine	video recorder	
fridge	sewing machine	
air conditioning	games console	
electronic game	electronic toys	
rice cooker	dish washer	
TV	alarm clock	
radio		[1]

(b) Award **one** mark for each task controlled e.g.

camera	film speed, position (end of film), distance, light	
washing machine	amount of water, speed of wash/temperature/time	
fridge	temperature, display panel	
air conditioning	temperature, timing, display panel	[2]

7 **One** mark each section.

F4		
L90/R270		
F4		
L90/R270		
F2		
L90/R270		
F2	one mark	
R90/L270		
F2	one mark	
L90/R270		
F2		
(any L/R, B1, B2)	one mark	[3]

8 (a) **One** from

text editor/web editor	
HTML (editor)	
word processing	
desktop publishing software	
web publishing software/web developing software/authoring	
presentation software	[1]

(b) **Two** from

changing the background colour or background image on a page	
formatting text (size, font, colour, bold, italic, underline etc.)/frames	
working with tables	
inserting graphics/pictures/sound clip/video clip/animations	
working with links/creating buttons/list box	
switching to a browser to check the appearance of a page	
use templates	
use auto tags	[2]

(c) on a server  
stored on ISP/web host (server) [1]

Page 5	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

- 9 (a) Any **two** from e.g.
- check digit
  - product number/item number/code
  - country of origin
  - manufacturers number/code
  - weight
  - price
- [2]
- (b) Any **two** points from
- check digit calculation is performed on the check digit remainder = 0 if barcode has been read correctly
  - weights and modulus 11 and use remainder or subtractions and addition and use answer
- [2]
- (c) random/direct/online
- [1]
- (d) **Two** from e.g.
- search file/master file
  - using barcode number/product code
  - and decrease number in stock/increase quantity sold
- [2]
- (e) Any **two** from e.g.
- more accurate/improved stock control/recording system/automatic reordering/automatic updating of stock file
  - less staff/wages needed
  - sales statistics now available
  - faster throughput
  - itemised receipt
  - records every transaction
  - records staff work rates
  - less pilfering by staff/easier to identify pilfering
  - less errors
  - faster calculations
  - links to EFTPOS
- [2]
- 10 (a) Any **four** points from
- specify output requirements
  - design documents/screen displays
  - data for input/storage
  - form design
  - storage devices
  - file structures/access/design
  - data security/back up files
  - systems flowchart etc.
  - implementation i.e. pilot/intermediate/parallel running
  - testing strategy
  - training
  - hardware/software
  - programming/algorithms
  - validation
  - user manual
  - technical documentation
  - entering data into system
- [4]



Page 6	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

(b) Two points from

user changes his mind  
 new government legalisation/company policy company changes  
 changes in hardware  
 changes in software/upgrades/new versions  
 improved operating efficiency/ease of use [2]

11 (a) Award **one** mark from each section

Hard disk drive

to hold the operating system/communication and applications  
 software/ISP software  
 for storing files/information/cookies on backing store

RAM

for data, computer programs and operating instructions which  
 are moved into it/downloaded  
 for data currently in use

DVD writer

Films/videos/pictures/music/multimedia data downloaded/  
 purchased

Modem

link/dial up/establish communication with the Internet  
 Convert digital signals to analogue/audio tones (and vice versa)  
 Which can travel across the telephone system

[4]

(b) Award **one** mark for each

for logging on - dial up/communications software/ISP  
 software  
 for searching - browser/search engine [2]

Page 7	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

(c) Award **one** mark for an advantage

on-line catalogues can be viewed  
much larger choice of products  
product reviews obtainable before purchase  
orders placed over internet any time day or night  
download software purchased straight away  
good and services usually cheaper on the internet  
programs that can search for best price/cheapest  
very fast placing an order has been placed as customer name, address  
and credit card details are stored so no need to re enter  
buy goods from anywhere in the world  
no need to go to shop/save travelling time

Award **one** mark for a disadvantage

spam  
need a credit card to shop on-line/not everyone has a credit card  
hackers could retrieve credit card numbers and use them to buy goods  
security fears - of giving credit card number over the internet/fraud  
goods must be delivered/can not have the goods immediately  
can not touch/handle/see the goods [2]

(d) Award **one** mark for each

loss of jobs as some traditional shops/banks close  
lower profits for companies that do not get involved with e-commerce  
decline of leisure shopping as goods are bought on-line  
city centres becoming deserted as shops/banks close down  
gap between rich and poor widening as richer get savings from  
shopping on-line  
more people choosing to interact with computers rather than people  
increase in small businesses  
less pollution/travelling [2]

12 (a) ONLY

general/text/alphabetic/alphanumeric/string/centred/bold/text-  
wrapped/sans-serif [1]

(b) Allow brackets

$B^3 * B^7 + B^4 * C^7$  or  
 $B^3 * B^7 + B^4 * C^7$  or  
 $B^7 * 3 + C^7 * 2$   
1 mark 1 mark [2]

(c) Award one mark per stage

select/highlight/click on D7  
description of copy and paste/replicate into cells D8, D9, and D10/fill  
down/drag and drop [2]

(d) =IF(D10 > E10, Profit, Loss) [1]

(e) A6:A10 and D6:E10 or

A7:A10 and D7:E10  
1 mark 1 mark

or individual cells listed e.g. A7, A8, A9, A10 and D7, D8....E10 [2]

<b>Page 8</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE EXAMINATIONS – JUNE 2004</b>	<b>0420</b>	<b>1</b>

**13 (a)** Any **two** from

Better/improved traffic flow control  
 reduces accidents  
 keeps delays to a minimum  
 reduces pollution  
 cars use less fuel [2]

**(b)** Award **one** mark each

input

from sensors  
 from camera images [Max 2]

processing

analyse data from sensors  
 calculate average traffic flow/speed  
 send signals to adjust change lights/timing [Max 3]

output

change lights at junction  
 change timing plan [Max 2]  
 [5]

**(c)** Award **one** mark

give uninterrupted path through the system of linked traffic lights/  
 green link - wave  
 turn all lights to red  
 activate emergency generator  
 alarm [1]

<b>Page 9</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE EXAMINATIONS – JUNE 2004</b>	<b>0420</b>	<b>1</b>

**14 (a)** Any **one** point from e.g.

star - if one computer goes down the others can still be used  
ring - if one computer goes down the others can not be used [1]

**(b)** On diagram drawn and labelled

correct network **one** mark

Any **two** from award **one** mark each

server  
printer  
modem/bridge/gateway [3]

**(c)** Any **two** from

share database (from one source)/access same information  
access to database by staff from any LAN machine  
only one database to backup [2]

**(d)** Any **two** from

data must be accurate/up-to-date  
personal data must be registered  
data must be used for the purpose that is registered for  
if data is to be used for another purpose the registrar must be notified/  
subject gives consent  
patients must able to see the data and have it changed if it is incorrect  
processed fairly and lawfully  
kept no longer than needed  
kept secure  
not transferred to other countries without protection [2]

**(e)** Any **one** way of saving - award **one** mark

backups/dumps of files  
copy of files on CD/tape streamer  
file generations

Any **one** from - award **one** mark

mirrored hard disk/hot stand by/second computer  
re-run the old master file with the transaction file [2]

Page 10	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

15 (a) Award **one** mark each

- (i) 33.8 [1]  
(ii) 41 [1]

(b) Award **one** mark for each correct step in the algorithm

Initialise  
Loop  
Input temperature (x24)  
Convert to Fahrenheit  
Find maximum and minimum  
Calculate average (outside loop)  
Output maximum, minimum, average [5]

Examples of correct answers are:

(i) sum = 0  
min = 100  
max = 0  
count = 1  
**while** count <= 24 **do**  
    **input** temp  
    F = (temp\*1.8) + 32  
    sum = sum + F  
    **if** F < min **then** min = F  
    **if** F > max **then** max = F  
    count = count + 1  
**endwhile**  
average = sum/24  
**print** average, min, max

(ii) sum = 0  
min = 100  
max = 0  
count = 1  
**repeat**  
    **input** temp  
    F = (temp\*1.8) + 32  
    sum = sum + F  
    **if** F < min **then** min = F  
    **if** F > max **then** max = F  
    count = count + 1  
**until** count > 24  
average = sum/24  
**print** average, min, max

Page 11	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2004	0420	1

<b>16</b>	<b>(a)</b>	6	[1]
	<b>(b)</b>	text/alphanumeric/string	[1]
	<b>(c)</b>	Award <b>one</b> mark per point  less errors on input requires less storage space validation quicker to input quicker to find	[2]
	<b>(d)</b>	<b>One</b> mark each  M1057, M1124	[2]
	<b>(e)</b>	<b>One</b> mark each stage  highlight/select SURNAME field click on sort A to Z icon/in menu  or query, click on (sort) ascending	[2]