

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.

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 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.

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
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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	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/alterd/
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]

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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]

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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]

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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]

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- 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]

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(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]

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(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]

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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]

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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]

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