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

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/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]

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]

3   (a) Two <u>PLACES</u> 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]

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]

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]

(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

<u>Hard disk drive</u>
to hold the operating system/communication and applications
software/ISP software
for storing files/information/cookies on backing store

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

<u>DVD writer</u>
Films/videos/pictures/music/multimedia data downloaded/
purchased

<u>Modem</u>
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]

(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

    B3*B7 + B4*C7   or
    B3*B7 + B4*C7   or
    B7*3 + C7*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]

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]

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]

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

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]