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
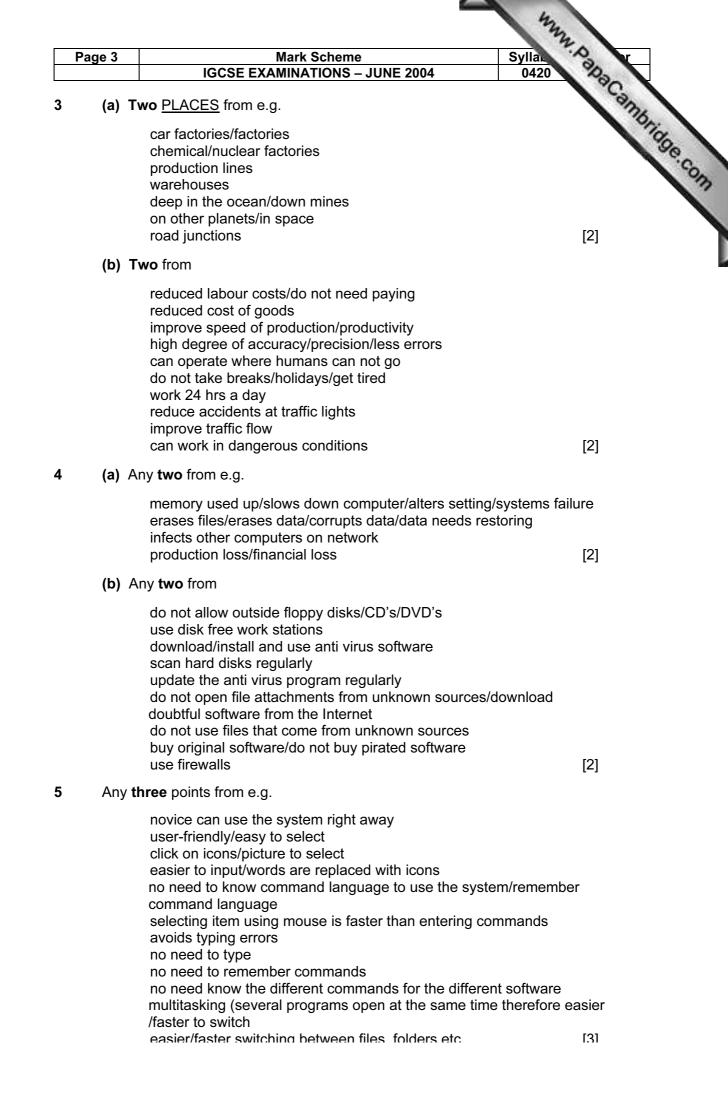
MARKING SCHEME

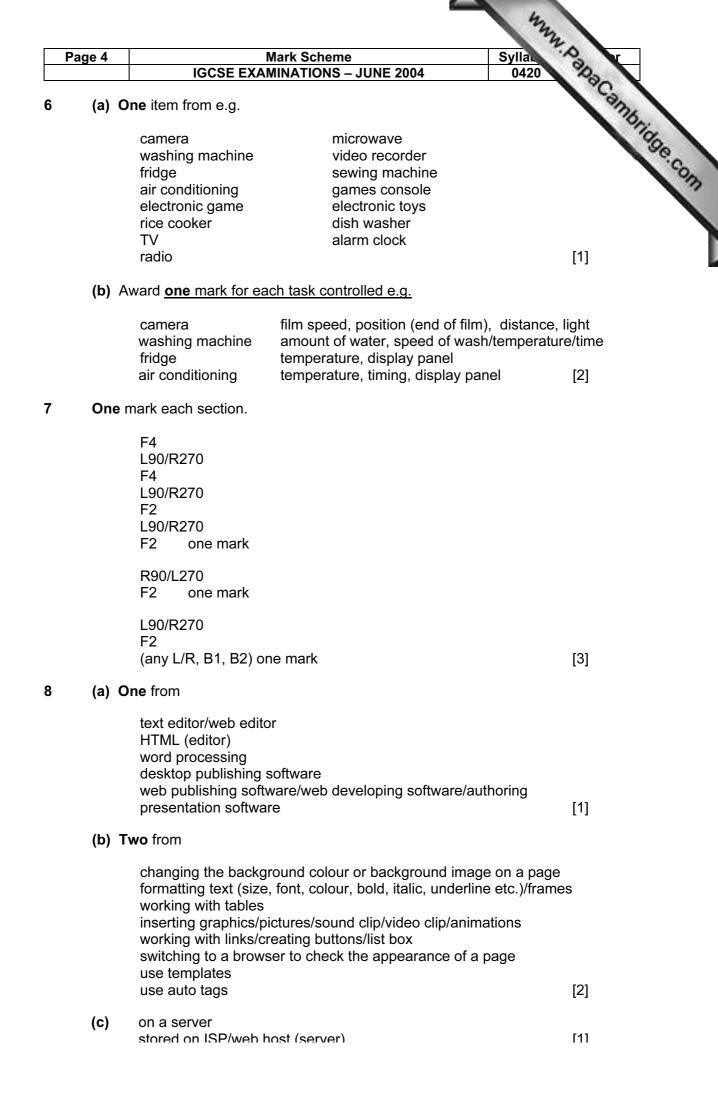MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 0420/01

COMPUTER STUDIES
Paper 1

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

(a) <u>byte</u>
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) <u>compiler</u>
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) <u>handshaking</u>
exchanging of signals
to establish communication
between two devices/computers
                e.g. printer and computer, modem and computer   [2]

(d) <u>technical documentation</u>
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) <u>simulation</u>
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
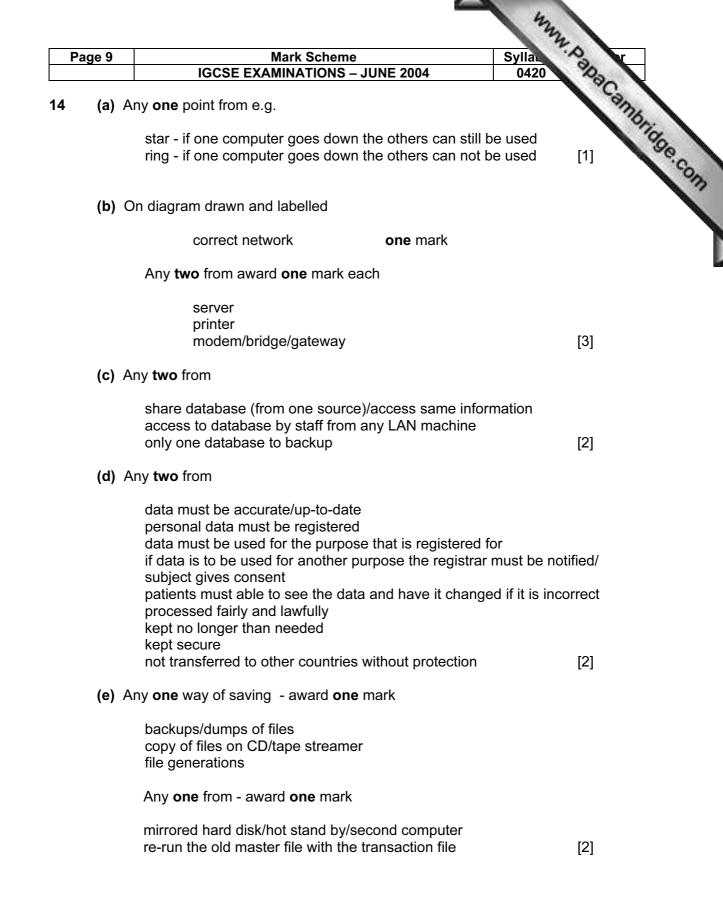entering data into system   [4]

(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
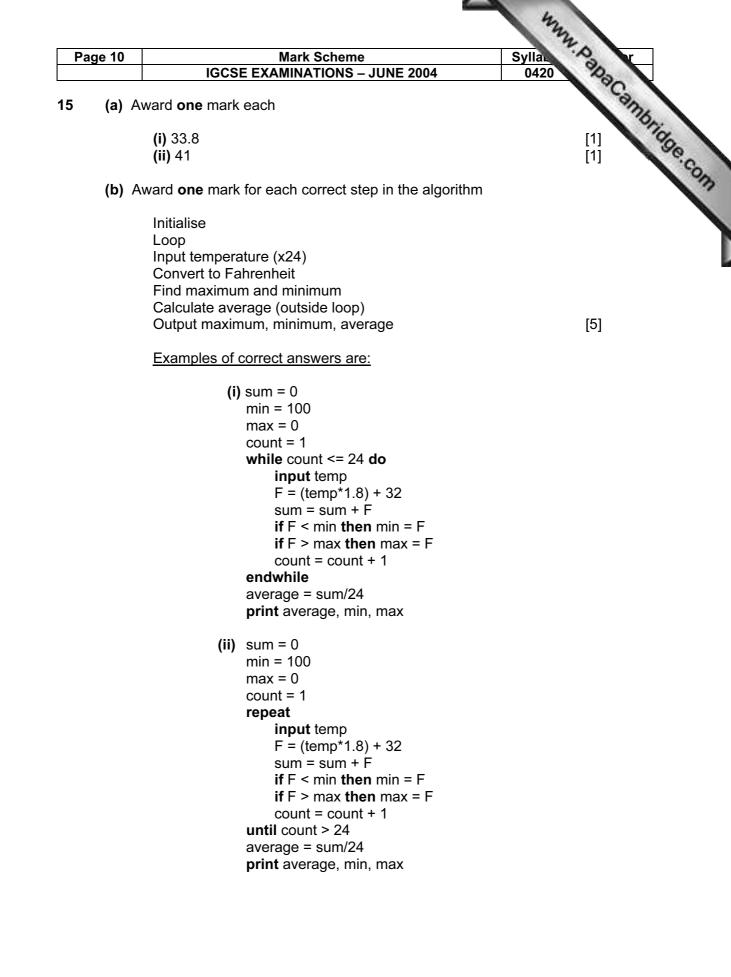   [4]

(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) <u>ONLY</u>
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

<u>input</u>

from sensors
from camera images   [Max 2]

<u>processing</u>

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

<u>output</u>

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]