CAMBRIDGE
INTERNATIONAL EXAMINATIONS

November 2003

INTERNATIONAL GCSE

MARK SCHEME
MAXIMUM MARK: 100
SYLLABUS/COMPONENT: 0420/01, 0421/01 COMPUTER STUDIES Paper 1

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1   **(a)   buffer**
any **two** from:
temporary
store/memory
compensates for speed of CPU/devices to be matched
holds data being transferred between peripheral devices and CPU
example:
printer buffer to store data to be printed   [2]

(b)   verification
any **two** from:
checking of data/correctness   proofreading = 0
by re-keying   check transmission = 0
comparing/use of second operator
double checking
example:
checking correctness of passwords   [2]

(c)   gigabyte
any **two** from:
one thousand million/billion bytes
one thousand megabytes/8 billion bits   (8,589,934,592 bits)
one million kilobytes
a unit of storage
2^{30} bytes
example:
reference to hard disk storage, etc.   [2]

(d)   batch processing
any **two** from:
process does not start until
all data collected together
uses JCL
no user interaction
example:
payroll system
electricity/water/gas (etc.) billing
cheque processing   [2]

(e)   file generations
any **two** from:
successive versions of a master file/GFS
(periodically) updated
used in cases of systems failure   to do back ups = 0
transaction file used to update master file
example:
supermarket stock control/updating stock   [2]

2   **(a)**   **RAM** (max: 1 mark)
         any **one** from:
         storage of (user's) data/holds program
         memory that can be used to read from/write to/change
         directly addressable
         temporary store
         volatile memory
         reference to dynamic/static RAM
         reference to operating system

         (NOT direct access)

         modem (max: 1 mark)
         any **one** from:
         modulator-demodulator
         device which interconverts digital bits and analogue signals
         to allow computer signals to be sent over phone lines
         to connect to the Internet

         scanner (max: 1 mark)
         any **one** from:
         device for transferring or copying printed documents/graphics
         converting to pixels/storing a computer file/digitise   to scan = 0   [3]

      (b)   **electronic conferencing**
         any **two** devices from:

microphone	telephone = 0
speakers	cabling = 0
web camera/video camera	network card = 0
sound card	keyboard = 0
video card	printer = 0
monitor/screen	
satellite dish	tv = 0

         (NOT modem, memory – already in question)   [2]

3 **(a)** any **two** from:

viruses can be introduced into the system
possibility of bribery/extortion/blackmail
fraudulent use of account   money stolen from accounts = 0
industrial/commercial sabotage   fraud = 0
computer system shuts down
locking user out by changing passwords   [2]

(b) any **two** from:

passwords for users/files
PINs/passwords changed frequently
disconnection after 3 failed attempts at password
use of firewalls
use of encryption
dial back modems
(NOT physical devices such as locking door, computer)   [2]

4 **(a)** any **two** from:

users can access same files   fast = 0
avoids duplication
network s/ware cheaper than buying individual s/ware for each machine
sharing of expensive s/ware
easier to control access to the internet
messages can be sent between terminals/chatting
can monitor usage
shared printers/hardware
work can be accessed from any terminal   [2]

(b) any **two** from:

when file server down, all terminals down
viruses can spread to all terminals
wiring (e.g. fibre optics) is expensive to buy/install   expensive = 0
distance to printer(s)
prone to hacking
often slow due to busy network
cable broken/one terminal down can cause whole system to fail   [2]

5 **(a)** any **two** from:
account number/card number
sort code/branch code/bank code   name = 0
expiry date/start date   money in account = 0
type of card (e.g. visa, master, etc.)
(NOT credit limit, PIN, issue number)   [2]

(b) any **two** from:
hologram built into card   PIN = 0
embedded chip containing coded data
signature on back of card   check digit = 0
picture
biometrics
digits on card   [2]

(c) any **two** from:
additional security identifier
card could be stolen/forged
to stop people getting money out illegally
acts like a password   [2]

6 **(a)** **electronic scabbing**
any **two** points from:
allows managers to switch
word processing/computer processing duties
from striking clerks in one country to non-striking clerks in
another   [2]

(b) any **three** from:
redundancies/unemployment/retrenchment
need for re-training/can't use hardware (and software)
expensive to set up/run
may be software problems
errors when transferring data to new system
security of data
deskilling
time to transfer data to new system
can be slow due to parallel running   virus = 0
quality of transferred documents can sometimes be poor   [3]

7   any **three** from:

items of user documentation (max: 2 marks):   user doc = 0
specimen input
specimen output
manuals/user guide/instructions to operate
troubleshooting/how to deal with errors
sample runs

items of technical documentation (max: 2 marks):   tech doc = 0
how to load/run/install software/software requirements (e.g. OS)
how to install hardware/hardware requirements
file structures
input/output screens/documents
testing strategy
decision tables
algorithms/program flowcharts
systems flowcharts/document flow
validation rules
(NOT costs, benefits)   [3]

8   **(a)** any **two** from:
most computers now have CD-ROM drives as well as/rather than
floppy disk drives
CDs are of better quality/more reliable
CD-ROM less likely to become corrupted
cannot delete/change data on CD-ROMs
would require too many floppy disks to hold program/files/data
cheaper to post out CDs   cheaper = 0
faster access
(NOT viruses, capacity of media)   [2]

   (b) **advantages**
any **two** from:
faster than normal mail   sending images/animation = 0
cheaper than post
easier to do repeat mailings
easier to get proof of confirmation of receipt

disadvantages
any **two** from:
customers may not have an e-mail address
e-mail protocol problems/e-mail server down
attached files too large
can't send original documents
messages may become corrupted
messages may be intercepted/hacking   [4]

9 **(a)** Code_ Num [1]

(b) 13504   (-1 mark for each additional answer)
      14005 [2]

(c) (Power(W) > 70)   OR   (Colour = "Silver")
    < - - 1 mark - - >   <1 mark>   < - - 1 mark - - - > [3]

(ignore case and quotes; don't accept 70W)

(d) 14010, 13425, 13416,   13504, 14001, 14005
    < - - - - 1 mark - - - - >   < - - - - 1 mark - - - - > [2]

10 **(a)** **(i)** anything from row 1 or column A [1]

       (ii) any cell from D2:D7 [1]

       (iii) any cell from B2:B7 or C2:C7 or E2:E7 or F2:F7 [1]

(b) **(i)** E2/F2 [1]

       (ii) highlight G2   move to cell G2
           copy/paste in cells G3:G7   drag formula into cells G3:G7
           (or the equivalent) [2]

(c) SUM(B2:B7) or B2+B3+B4+B5+B6+B7 or SUM(B2+B3+B4+B5+B6+B7)
                                                     [1]

(d) any **two** from:
      use of graphs to extend the line for future 6 months   graphs = 0
      double the totals in row B8 and E8
      use formulae in spreadsheet to calculate costs/total costs
      based on existing costs [2]

11 **(a)** 150   abnormal reading
       400   normal speed
       800   high speed
       (ignore word "speed" in answer) [3]

(b) any **two** points from:
      only data 0 to 9 would register
      all other data would give "abnormal reading" message/incorrect response
      variable **whole** would not exist
      thus **whole** would be zero OR algorithm would crash/fail [2]

12 **(a)** 4

F   [2]

(b) (1) 01111110

(2) 01110000   [2]

(c) **(i)** any **one** from:

drivers used to analogue instruments

readings are steadier

more accurate (because of infinite number of positions)

easier to see "trends" in read outs/easier to understand   [1]

(ii) any **one** from:

not as easy to read as digital

needs to be interpreted by user

mechanical device more likely to break down/fail   [1]

13 **(a)** any **four** points from:

gather data from experts   set up user interface = 0

create/design a knowledge base

create/design structure relating items in knowledge base

create/design interrogation technique

create/design the screen outputs/inputs

reference to an inference engine

create/design rule base   [4]

(b) any **two** features from:

question and answer dialogue   hyperlinks = 0

help facility

coded maps (etc) displayed on screen showing mineral concentrations

multichoice questions or yes/no questions

easy to use input screens/pull down menus/windows/icons   [2]

14 **(a)** any **three** from:

pressure sensors   sensor = 0

temperature sensors/thermistor   heater=0

pH/acidity sensor

level sensor   thermocouple = 0

ADC   thermometer = 0

DAC

actuators

(ports, screens, printers = 0)   **[3]**

(b) any **two** from:

information about output of a system sent back to computer

to adjust, if necessary, input of system

in such a way that output meets some desired values in memory

compares stored values   **[2]**

(c) any **two** from:

removes human error/increases accuracy

can collect data over long periods of time/automatically

data can be automatically stored and used in other programs

safety considerations (chemical reaction)/hazardous conditions

can be programmed to automatically display reaction status at regular intervals

(costs = 0)   **[2]**

15 Marks should be awarded as shown.
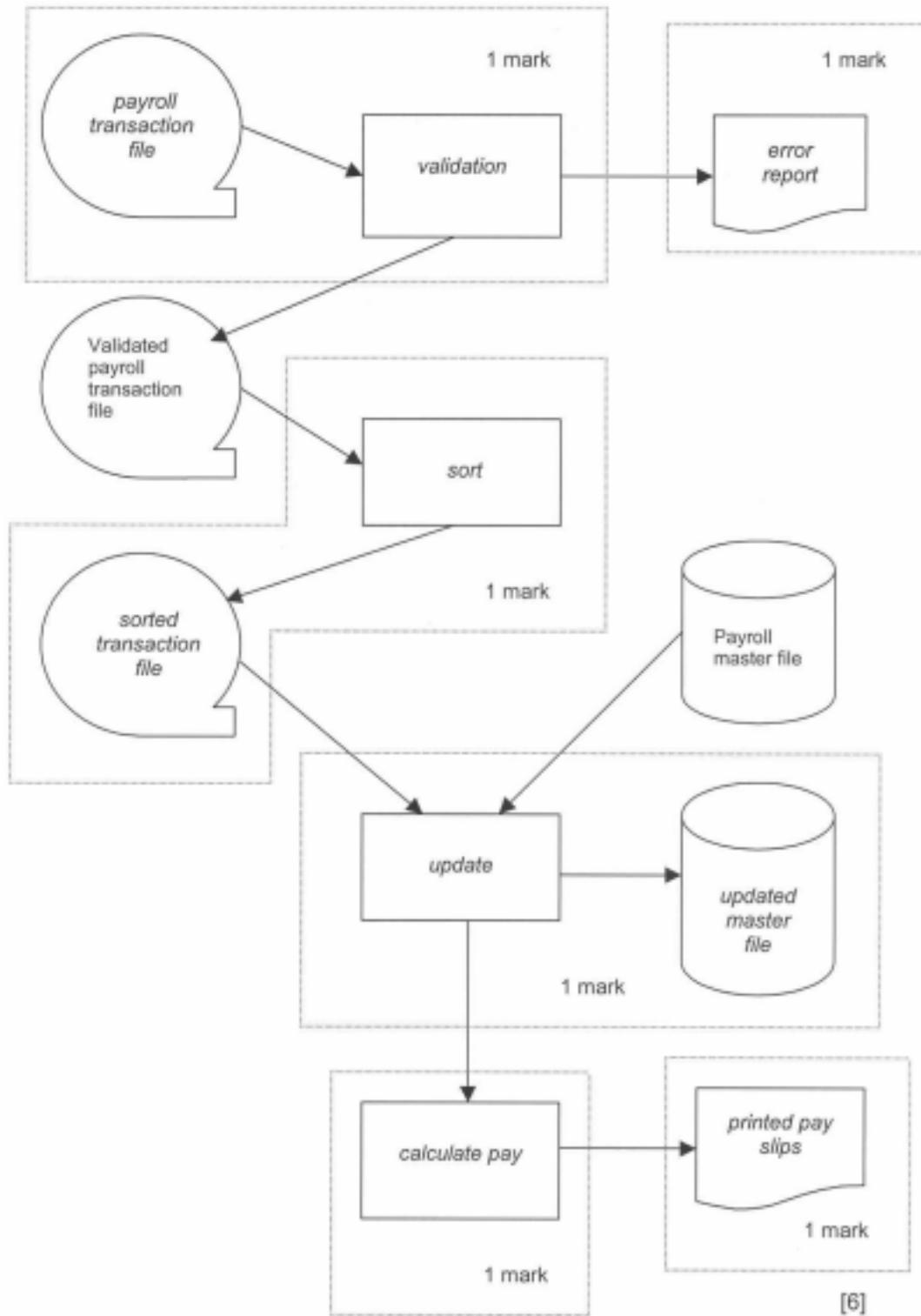
16 (a) wrong = 0   (1 mark)

         for count = 1 **to** 50   (1 mark)

                input number   (1 mark)

                if number < 1000 **or** number > 9999   (2 marks)

                      then wrong = wrong + 1   (1 mark)

                endif

        next count

        percent = wrong * 2   (1 mark)

        output wrong, percent   (1 mark)

        (accept flow charts but not essays)   [6]

        (**General answer:**

Initialise variables	– 1 mark
Loop control	– 1 mark
Input number	– 1 mark
Check numbers in range	– 2 marks
Increment incorrect numbers total	– 1 mark
Calculate the percentage	– 1 mark
Output totals	– 1 mark)

   (b) any **two** validation checks with examples:

        length check

        example: make sure there are always 4 digits/characters input

        character check

        example: make sure only numbers are input and not letters

        type check

        example: 0 decimal places/integer value

        (format check, check digit, presence check = 0)

        (example must tie up with validation check for second mark and conversely)   [4]