

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]

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- 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]

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- 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]

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- 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]

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- 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]

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- 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]

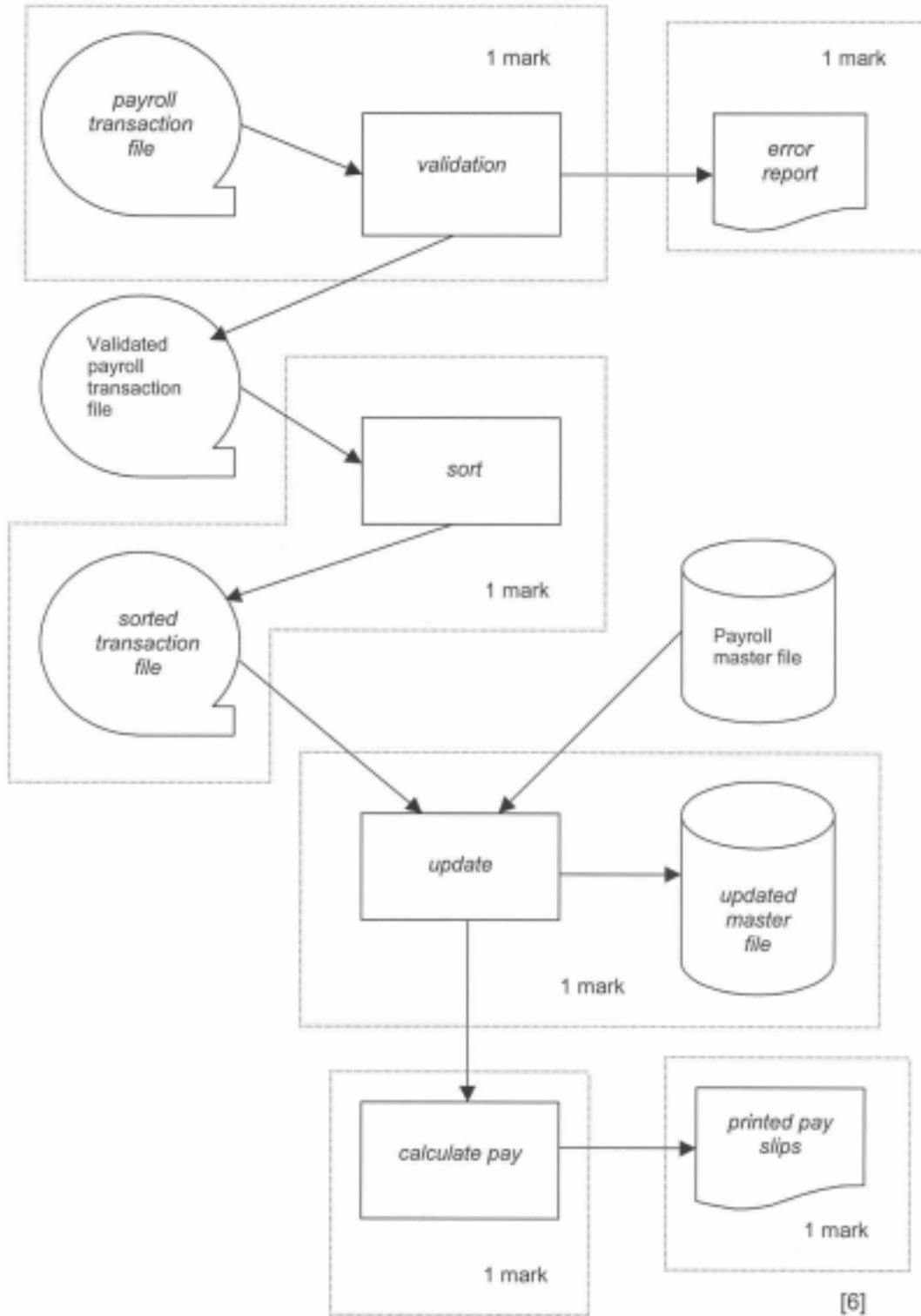
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- 12 (a) 4
F [2]
- (b) (1) 01111110
(2) 01110000 [2]
- (c) (i) any **one** from:
drivers used to analogue instruments
readings are steadier
more accurate (because of infinite number of positions)
easier to see “trends” in read outs/easier to understand [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]

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- 14 (a) any **three** from:
- pressure sensors sensor = 0
 - temperature sensors/thermistors 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.



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- 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]