

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

November 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 0420/01, 0421/01

COMPUTER STUDIES
Paper 1

Page 1	Mark Scheme	Syllabus
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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
 - expiry date/start date
 - type of card (e.g. visa, master, etc.)
 - (NOT credit limit, PIN, issue number)
- name = 0
money in account = 0
[2]
- (b) any **two** from:
- hologram built into card
 - embedded chip containing coded data
 - signature on back of card
 - picture
 - biometrics
 - digits on card
- PIN = 0
check digit = 0
[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
 - quality of transferred documents can sometimes be poor
- virus = 0
[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) [2]
14005
- (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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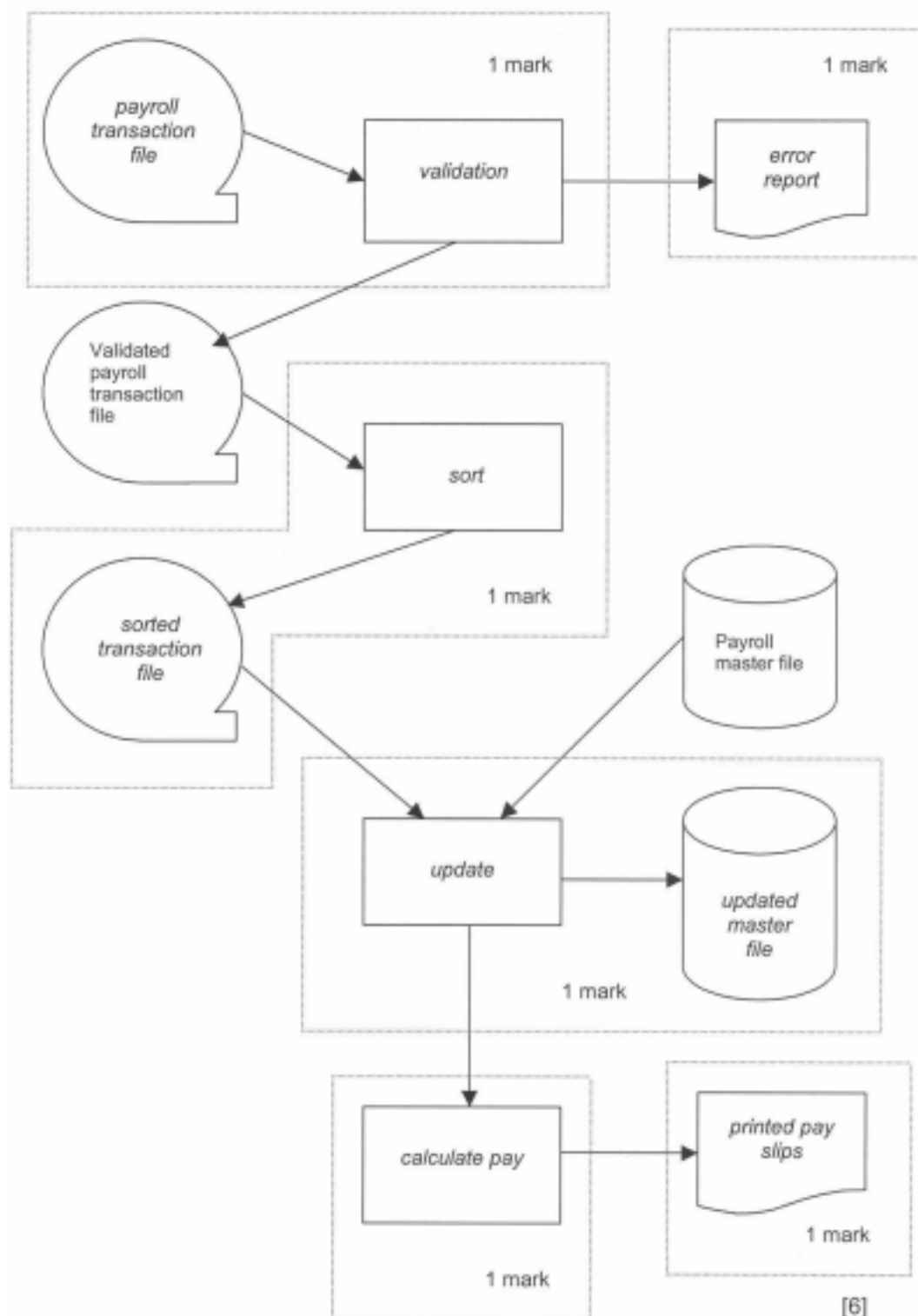
- 12 (a) 4
F [2]
- (b) (1) 01111110
(2) 01110000 [2]
- (c) (i) any **one** from:
drivers used to analogue instruments
readings are steadier
more accurate (because of infinite number of positions)
easier to see "trends" in read outs/easier to understand [1]
- (ii) any **one** from:
not as easy to read 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
 - temperature sensors/thermistor
 - pH/acidity sensor
 - level sensor
 - ADC
 - DAC
 - actuators
 - (ports, screens, printers = 0)
- sensor = 0
heater=0
thermocouple = 0
thermometer = 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]

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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]