UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE O Level

MARK SCHEME for the November 2005 question paper

7010 COMPUTER STUDIES

7010/01 Paper 1, maximum raw mark 100

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does 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.

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UNIVERSITY of CAMBRIDGE
International Examinations

1 (a) Expert System

Any **one** from
contains/programmed with the knowledge of human experts
knowledge base
inference engine
uses rules/rule base
man/machine interface
ability to "add to its knowledge"/learn from previous experience
examples: chess, medical diagnosis, mineral prospecting, car diagnostics, tax calculations, etc. **[2]**

(b) Electronic scabbing

Any **one** from
allows managers to switch …
word processing/computer processing duties …
from striking clerks in one country/location to non-striking clerks in another **[2]**

(c) Top down design

Any **one** from
breaking larger tasks
into (successively) smaller tasks
step-wise refinement
examples allows use of modules, allows several programmers to work on task **[2]**

(d) Interrupt

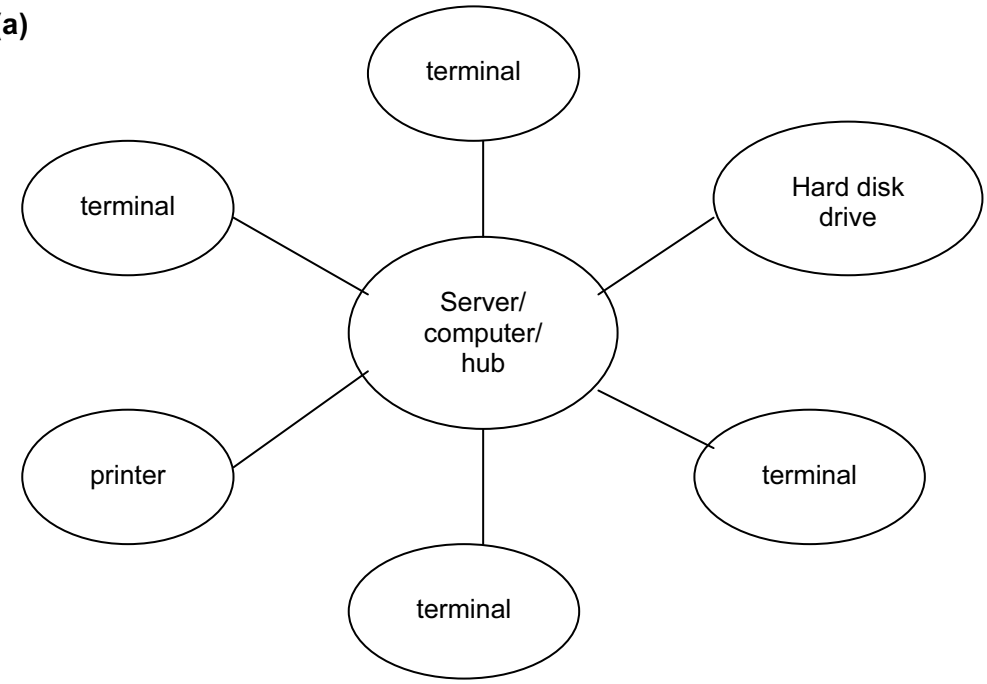
Any **one** from
a signal/message
generated by a device/operating system/hardware/software
which causes a break in the execution of a program/stops running of program
examples: overflow errors, disk full error, printer out of paper error etc. **[2]**

(e) Buffer

Any **one** from
temporary
store/memory
holds data being transferred between devices
often used to compensate for different speeds of devices
examples printer, disk, etc. **[2]**

2 Any **three** from:
less expensive option (reference to costs needs to be justified)
fully tested/more reliable/less errors
links with existing software
immediately available/quicker needs justification
expertise/programmers not available ready trained workforce **[3]**

3 (a)



1 mark for printer
1 mark for terminals/workstation/computer/workbase
1 mark for showing correct connections
1 mark for hard disk drive
1 mark for server/computer/hub
(max of 3 mks)
(simple unlabelled diagram can only gain a max of 1 mark) **[3]**

(b) Any **one** from:
gateway/router/proxy server/modem **[1]**

4 (a) 1 mark for each cause and 1 mark for correct prevention

Causes	Prevention
Loss of software/files	Ensure files are protected (e.g. locked, hidden, etc.)
Hardware failure	Use parallel systems
Hacking into system	Use of passwords/firewall
(Sending) viruses	Anti-virus software/not opening suspicious emails
Loss of power	UPS/generator
Spam	Use of a filter

[4]

(b) Any **two** from
Use file generations/grandfather-father-son method
Re-load software/files
Re-enter lost data
(Use) back-up files to transfer data
New/alternative hardware **[2]**

5 **(a)** Any **two** points from
processing takes place in one go/all at once/at a convenient time
when data has been collected
no human interaction required
reference to JCL

[2]

(b) Any **one** point from
(real time transaction system is an) on-line system …
in which transactions are processed as they occur
always up to date

[1]

(c) **(i)** Any **one** from
payroll
updating stock levels at end of the day
printing out invoices
printing out orders

[1]

(ii) Any **one** from
getting prices
automatic stock levels
on line shopping
credit card transactions
calculating the bill

[1]

6 **(a)** Any **two** from
can print confirmation/boarding pass
can see seating plans
easier to locate special offers
encryption of data/https
telephone can be engaged/waiting in queuing system

[2]

(b) direct/random access

Any **one** from
need to update files immediately
requirement for fast access **[2]**

(c) **(i)** Any **one** from
character/type check
length check
range check
allow sensible examples

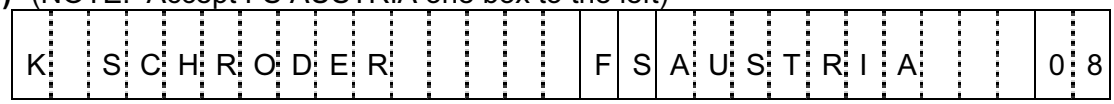
(ii) Any **one** from
format check
length check
range check
cross field check i.e. cannot be after date of return flight

(iii) Any **one** from
length check
check digit
character/type check

(**three different** validation checks are needed for all three marks) **[3]**

7 **(a)** Finance/Management **[1]**

(b) (NOTE: Accept FS AUSTRIA one box to the left)



< - - - - - - - - - - - - - - - 1 mark - - - - - - - - - - - - - -><- - - - - - - - - - -1 mark - - - - - - ><1 mk>

[3]

(c) Any **two** advantages from
shorter, therefore less memory/storage used
shorter, therefore less typing required/faster input
less chance of errors being made
easier/faster to carry out searches/process data
easier/faster to do validation checks

[2]

(d) **(i)** Any **one** from
changes every year
files would need to be updated every year **[1]**

(ii) date/year employee joined the company **[1]**

8 **(a)** Any **three** from
allows 3D imaging
can carry out calculations e.g. costing, volume, area, stress
test the design
graphics features (arcs, in-fill, zoom, scale, etc.)
access to previous designs/library of parts
easy to modify drawings to suit customer requirements
drawings are more accurate

(reference to CAM = 0)

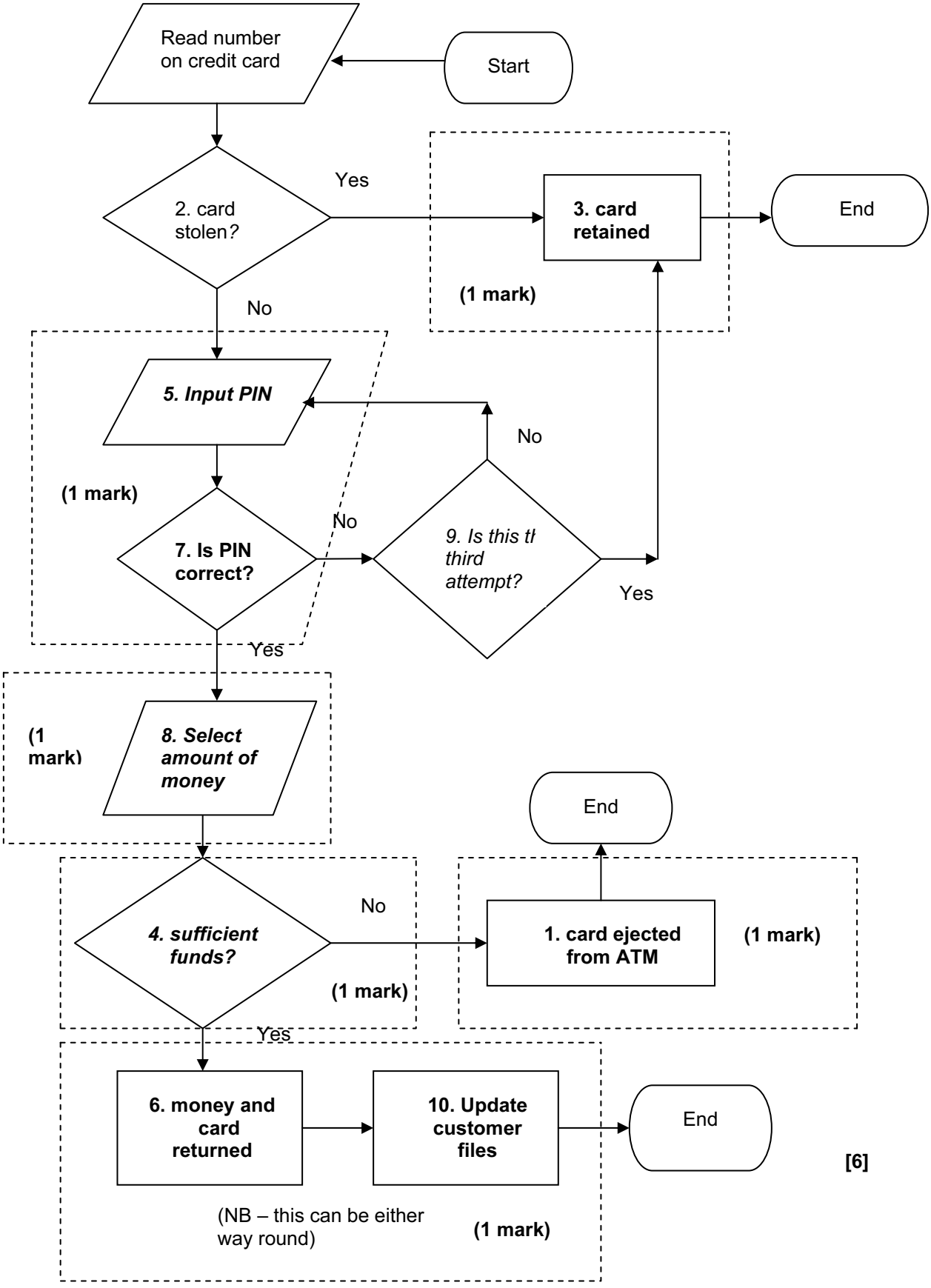
[3]

(b) **(i)** high resolution monitor/projector

(ii) (graph) plotter/inject printer plus specification

[2]

9



[6]

10 (a) Any **one** from

Digital displays:
actual numbers
LED/LCD sections lighting up

[1]

Any **one** from
Analogue displays:
dial read out
continuous variation/wave representation (e.g. sound, temperature)

[1]

(b) Any **one** from
faster response
more robust (no mechanical bits to go wrong)
no user interpretation required/easier to read

[1]

(c) Any **one** from
more natural/humans used to the format
readings are steadier/less fluctuation
easier to repair if fault develops (no electronics)
more accurate

[1]

(d) (i) Any **one** named device from
e.g. television/radio/video/washing machine/camera/toaster

(ii) Any **one** description which must match up with choice in part (i)
e.g. stores channels/controls recording timings/controls chosen wash cycle/controls shutter speed/controls timing

[2]

11 1 mark per input device + 1 mark for correct reason

input device	**reason**
- tracker ball	- to control on-screen pointer - if limited mobility in hands
- voice input/microphone } speech recognition }	- to control data input to the computer - if user unable to use the keyboard
- touch screen	- using a head wand/fingers - to select options from a screen menu
- foot activated input devices	- when operator has no arm movement - used instead of mouse or keyboard
- braille keyboard	- raised dots on keyboards to id keys - to help blind people input data

1 mark per output device + 1 mark for correct reason

output device	**reason**
- audio output/speaker	- to help blind/partially sighted people - who cannot see output on a screen/so they can hear the output
- braille printer	- to help blind/partially sighted people - to read output from the computer

[4]

12 (a) Any **two** analysis tasks from
understanding the current system/modelling the current system/Data Flow Diagram
identification of the user's requirements
interpreting user requirements
defining user requirements for the new system
research using interviews, observation, questionnaires, looking at existing documentation
agreed objectives
collecting data from existing system

(cost benefits = 0)

[2]

(b) Any **two** design tasks from
select/specify hardware
select/specify software
design input specification/screens
design output specification/screens
file design
break down of the task/top down design/modularisation
estimate the resources required
systems/process flowcharts/block/structure diagrams
process algorithms
design data capture forms
design reports
design forms
design test plan
produce implementation plan
validation techniques

[2]

(c) Any **two** implementation tasks from
produce documentation
install hardware and software
testing of the software/system
training of staff to use system
transferring of files to new system
system changeover (i.e. direct, parallel, pilot or phased)
maintenance/fix any unexpected problems
creation of files

(test strategy = 0)

[2]

13 (a) either

B2/2 or B2*0.5 and C2/2 or C2*0.5

or

B2/2 or B2*0.5 and B2/4 or B2*0.25

[2]

(b) Any **two** from
draw graph …
read off values for years 2008 and 2010
add two extra columns in the spreadsheet …
estimate values using new formulae

[2]

(c) either

SUM(B2:B6) B8=SUM(B2:B6)
(**NOT** SUM(B2:B6)=B8)

or

(B2+B3+B4+B5+B6) B8=(B2+B3+B4+B5+B6)
(**NOT** (B2+B3+B4+B5+B6)=B8)

[1]

14 (a) Any **three** from
increases productivity
saves on office space
increases staff motivation
makes trading hours more flexible
allows employment of staff irrespective of location
lowers absenteeism
increased staff retention
reduction in office requirements e.g. heating, lighting, ancillary staff, etc.
easier to employ disabled workers quota

[3]

(b) Any **two** from
reduces travelling costs
reduces travelling time/less commuting time
reduces stress levels
allows greater flexibility/social life/family life
greater job satisfaction
disabled employees are not disadvantaged

[2]

(c) Any **two** from
use of video conferencing/teleconferencing facilities
Internet access
electronic mail – can send attachments (e.g. video)
broadband – fast transmission of data allows real time interaction

[2]

15 (a) 1 temperature sensor } 1 mark

2 ADC } 1 mark

3 computer } 1 mark

4 DAC } 1 mark

(maximum of 3 marks) **[3]**

(b) Any **two** from
- control system where the output can affect the input to the system
- stored value compared with input
- current temperature is feedback value
- output from system changes (e.g. switch on chemicals pump) to try and equalise the two values
- process is repeating loop **[2]**

(c) Any **two** from
- safer system (no need for manual intervention/automatic control)
- better/more accurate temperature control
- easier to modify process when under computer control
- possible to interrogate system (e.g. produce temperature graphs)
- more efficient (less energy wastage) due to more accurate control
- continuous(24/7) process
- quality of product is more consistent

(more accurate = 0)

[2]

16 (a) Any **three** from
use of photographs/pictures/graphics
use of sound/audio/music
use of different fonts/text
reveal techniques
call up software/files……..allow examples
use of hyperlinks
connect to a web page
use of animation effects
embedded videos
timed transition between pages
presentation themes

[3]

(b) Any **two** from
emails
file attachments can be sent
compressed file/zip
reference to use of web site
(reference to send by post = 0)

[2]

17 Sample program

```
m1 = 100                                          }
m2 = 0                                            }  1 mark
sum = 0                                           }
n = 1                                             }
while n < 151 do                                     1 mark
  repeat
                read mark                            1 mark
  until (mark >= 0 and) mark <101                    1 mark (validation check)
  if mark < m1 then m1 = mark                        1 mark
  if mark > m2 then m2 = mark                        1 mark
  sum = sum + mark                                   1 mark
  n = n + 1
endwhile
average = sum/150                                    1 mark
output average, m1, m2                               1 mark
```

[6]

General mark points

initialisation (must correctly set smallest (m1) and largest (m2) boundaries)
method for looping round for 150 students
reading in marks for all students
checking if mark inside 0 to 100 boundary and action taken
setting value of smallest (m1) after checking against input mark
setting value of largest (m2) after checking against input mark
totalling all marks together
calculating the average mark
output of average, smallest mark (m1), largest mark (m2)