**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

GCE O Level

# MARK SCHEME for the May/June 2006 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.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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

**(a)** *smart card*
integrated/microprocessor chip card
data held in tiny silicon chip
replaces the need for magnetic stripes
harder for criminals to copy/change data
used by banks, mobile phones, satellite TV receivers
card contains a (micro) chip
e.g. credit card/debit card, loyalty card, mobile cards?ID card?room card?ATM card/driver license **[2]**

**(b)** *relational database*
contents of files are linked/data held in a number of interrelated files or relations
linked by common fields
uses tables (**one** mark), linked (**one** mark)
used in e.g. schools/hospitals/banks/supermarkets **[2]**

**(c)** *read-only memory (ROM)*
non volatile memory
used to store systems software
read from but not written to
cannot change
e.g. bios stored on ROM/boot strap/PROM/EPROM/CD/DVD **[2]**

**(d)** *de-skilling*
skilled/semi skilled labour
replaced by microprocessor-controlled systems
e.g. manufacturing, office work **[2]**

**(e)** *top down design*
breaking down the problem/task/program
into sub problems/smaller tasks/modules
stepwise refinement **[2]**

**2** **Two** features from e.g.

| | |
|---|---|
| download screen savers | bluetooth |
| receive text messages | phone book |
| internet | video conferencing |
| caller display | ring tones |
| PIN code | fax |
| picture messaging | time |
| date | storing numbers |
| flash to inform user of calls | games **[2]** |

**3** **(a)** **One** effect from

fraud/transferring money
viewing sensitive confidential data
changing data
selling data
virus/logic bomb
blackmail
loss of data/file
misuse + qualification **[1]**

**(b)** **Two** ways from

passwords/codes
encryption
monitoring attempts to access the system/logging use
lock keyboard/computer/doors
firewalls
smart card
fingerprints/biometrics
do not read emails from unknown sources
USB security device **[2]**

**4** **Three** file management tasks from

protect files against unauthorised access
allocate/de allocate space for files on storage device
keep track of allocation units occupied by each file
maintain the file allocation table (FAT)
control file access rights and permission/passwords
load/save/copy
load/save
sort
merge
search
delete
file security
de-fragment
rename
calculate file size/space left
automatic backup
directories **[3]**

**5** **(a)** **Two** ways from

on-line teaching/testing
multimedia presentation/slide show/use multimedia
interactive board
use internet/access web sites e.g. see expert systems demo
video conferencing
research
simulations e.g. dangerous experiments
networked computers (qualified) **[2]**

**(b)** **Two** ways from

e-mail/file attachments
send document as a FAX using computer
put on bulletin board
put on school web site
use ISP messaging facility
use ISP texting facility
video conferencing
on-line chat
LAN (qualified) **[2]**

**6** **(a)** **Two** benefits from

similar to English
easy to understand
easy to correct errors/test
problem orientated
portable **[2]**

**(b)** Award **one** mark for example and **one** mark for reason

example e.g. operating system
defragmenter
device driver
booting
game

reason fast response/execution
no need to compile/compiler is slower
1 → 1 with machine code

**[2]**

**7** **(a)** A cell in the range B7:B12, or E3 **[1]**

**(b)** Select/highlight the cells (B7:E13), Format, Cells, Currency
Format B7 to currency/money symbol, click on symbol and drag to E13 **[2]**

**(c)** **=**SUM(B7:B12) or (B7+B8+B9+B10+B11+B12) **[1]**

**(d)** =B7/2 or B7* 0.5 **[1]**

**(e)** C10:E10 **one** mark
B13:E13 **one** mark **[2]**

**(f)** B6:E6 **one** mark
B13:E13 **one** mark **[2]**

**8** **(a)** **One** item from

probe/sensor, oxygen sensor/gas sensor
AD converter **[1]**

**(b)** **Two** from

AD converter (if not awarded in **(a)**)
sensor (if not awarded in **(a)**)
data stored in database/file
compared with
set parameters
previously stored readings **[2]**

**(c)** **Two** from

spreadsheet
graph/chart
database/table **[2]**

**(d)** alarm, signal/messages on screen **[1]**

**(e)** **Two** advantages from

data downloaded periodically/in batches
readings are taken automatically
accurate measurements are made
no human error
readings are taken at exactly the right time
readings are taken continuously/ 24/7
automatic calculations can be made **[2]**

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

**(b)** 10, 5, **one** mark 16, 8, 4, 2, 1 **one** mark **[2]**

**10** **(a)** **Two** advantages for the bank from

less staff/employment costs/queues in the bank
can close branches/less costs for maintaining branches
less paper/electronic transactions/less cheques/less cash/no cheques/no cash
new international customers **[2]**

**(b)** **Two** disadvantages for the customer from

need to have/be able to use devices capable of accessing the internet
cannot have the personal service offered by the conventional bank
cannot get cash/cannot put in cash
insecure/security risks/fraud/hacking
cost of ISP/phone bill
if there is no broadband then the phone lines are tied up **[2]**

**(c)** **Three** data protection rules from

data must be up-to-date
the data can only be used for the purpose for which it was collected
data must be accurate
data must be destroyed when no longer needed/be deleted
data user must register what data is stored and the use
data must be used fairly and lawfully
data must be protected from accidental damage
only authorised people can have access to that data
hackers are prosecuted
fines are imposed data is misused
data should not be passed on from one organisation to amother
can view and change the data **[3]**

**11** **(a)** **Two** fact finding methods from

interviewing/asking questions
questionnaires
observing
inspecting files/paper/screens **[2]**

**(b)** **Two** items from

cost/benefit analysis
any conflict between requirement and law
development time
whether the technology exist/is it practical
description of business plus problems
the part of business being looked at e.g. processing of orders
objectives of the proposed system
alternative solutions and why others were rejected
whether the staff have the expertise to cope with the new system/is there enough money to go ahead/technology available
plan for implementation
course of action/how to proceed
cost of the system **[2]**

**(c)** **Three** tasks from

| | |
|---|---|
| decide on | software<br>hardware |
| design | input formats - data collection forms/screen designs etc.<br>output formats<br>file structures/tables<br>test plan<br>flow charts/algorithms<br>processing - systems flowchart/batch real-time/type of file access **[3]** |

**(d)** **One** changeover method from

direct
parallel
phased
pilot **[1]**

**12** **(a)** Award **one** mark for each correct row in the table. **[4]**

| | Data type | Field length | Validation check |
|---|---|---|---|
| Name | text/alphanumeric/string | 20 - 50 | type check, presence check |
| Address | text/alphanumeric/string | 30 - 50 | type check, presence check |
| Date of birth | | min 8 | DATE picture/format, check, length/range/presence check |
| E-mail address | text/alphanumeric/string | min 15 | type check, presence check |

**(b)** Award **one** mark each

appropriate heading i.e. Club name/Application form
all 4 fields present
structured data collection form on screen
sufficient space for data
Events - icon/hyperlink/hot spot on screen **[5]**

**(c)** **One** reason from

two people can have same name/address/details
used as a key field/primary key
search for particular members/to locate that particular record **[1]**

**(d)** **One** situation from e.g.

change of address/phone number/e-mail address/marry **[1]**

**(e)** random/direct access **[1]**

**13** **(a)** **Three** from

input 'faults' /respond to questions
knowledge base searched
using inference engine/rules
solution(s) suggested
knowledge base contains knowledge of experts **[3]**

**(b)** **Two** applications from

medical diagnosis
construction industry - quantity surveyor costings
mineral prospecting/geological surveys - oil/mineral deposits/a reasonable description of prospecting
social services - calculate benefit
financial services - predict stock market movement/recommend investments
chess
forensic science **[2]**

**14** **(a)** **Two** reasons for using batch processing from

large volume of data/bills
off-line preparation
no immediate urgency for batch of data to be processed
instant processing/immediate results not required/bills done monthly
computer used for other jobs, batch processing done in quiet time and the computer is sued for other things in busy times **[2]**

**(b)** Award **one** mark each

validate

errors

validated transaction file

sorted transaction file

update

master file **[6]**

**(c)** Award **one** mark per point

use of 'grandfather/father/son' files (or backup)
re-run old master file with transaction file
follow disaster recovery plan **[2]**

**15 (a)** **Four** features from

3D views
rotation
modifying stored drawings
calculations
cross-sections
surface area
volume
simulation
zoom
colour
library of shapes/drawings
accurate measurements **[4]**

**(b)** **One** benefit from

flexible manufacturing
product changes can be made quickly
product changes can be made inexpensively
manufacturer can respond quickly to current demands
modifications to the products can be made without the delay of change in setup
consistency of product **[1]**

**16 (a)** Award **one** mark

20 **[1]**

**(b)** Award **one** mark for each correct step in the algorithm

| | |
|---|---|
| Initialise | **one** mark |
| Loop (30) | **one** mark |
| Input ID, weight, height | **one** mark |
| IF……THEN……ELSE<br>(or CASE OF…….OTHERWISE) | **three** marks |
| Calculate BMI | **one** mark |
| Output ID, BMI and comment | **one** mark **[6]** |