

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.

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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]

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(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]

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- 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]

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(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) $\leftarrow \begin{matrix} 10, 5, \\ \text{one mark} \end{matrix} \rightarrow$ $\leftarrow \begin{matrix} 16, 8, 4, 2, 1 \\ \text{one mark} \end{matrix} \rightarrow$

[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 another
 can view and change the data

[3]

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

interviewing/asking questions
 questionnaires
 observing
 inspecting files/paper/screens

[2]

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(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
hardware

design input formats - data collection forms/screen designs etc.
output formats
file structures/tables
test plan
flow charts/algorithms
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]

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(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 used for other things in busy times [2]

(b) Award **one** mark each

_____ validate errors
 validated transaction file

 sorted transaction file
 update
 master file _____ [6]

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(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 (or CASE OF.....OTHERWISE)	three marks
Calculate BMI	one mark
Output ID, BMI and comment	one mark

[6]