

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*.

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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

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

[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
- finances 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

(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

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

[6]