**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

International General Certificate of Secondary Education

# MARK SCHEME for the May/June 2006 question paper

## 0420 COMPUTER STUDIES

**0420/01** Paper 1, maximum mark 100

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do 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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the May/June 2006 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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

**(a)** *smart card*
integrated 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 **[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 **[2]**

**(c)** *read-only memory (ROM)*
non volatile memory
used to store systems software
read from but not written to
cannot change **[2]**

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

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

**2** Any **two** features

download screen savers
receive text messages
internet
caller display
PIN code
range 59 m indoors, 300 m outdoors
clear signal **[2]**

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

fraud/transferring money
viewing sensitive confidential data
changing data
sell data
virus/logic bomb
blackmail **[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
restrict access
set up false web sites **[2]**

**4** Any **three** file management tasks from e.g.

load/save
sort
merge
de-fragment
delete
calculate file size/space left
automatic backup
directories **[3]**

**5** **(a)** Any **two** ways from e.g.

on-line teaching/testing
multimedia presentation
interactive board
use internet – access web sites e.g. see expert systems demo
video conferencing **[2]**

**(b)** Any **two** ways from e.g.

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 **[2]**

**6** **(a)** Any **two** advantages from e.g.

H L similar to English
H L 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 |
| | game |
| reason | fast |
| | 1 → 1 with machine code |
| | no need to compile/uses assembler **[2]** |

**7** **(a)** B7:B12, E3

**(b)** Select B7:E13,
Format, Cell, Currency

**(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** from

probe/sensor
AD converter **[1]**

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

data stored in computer database
compared with set parameters
compared with previously stored readings **[2]**

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

graph
database table **[2]**

**(d)** alarm **[1]**

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

readings are taken automatically
accurate measurements are made
no human error
readings are taken at exactly the right time **[2]**

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

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

**10 (a) Two** from

less staff/employment costs/queues in the bank
can close branches/less costs for maintaining branches
less paper/electronic transactions **[2]**

**(b) Two** from

need to have/be able to use devices capable of accessing the internet
security risks
cannot have the personal service offered by the conventional bank
cannot get cash **[2]**

**(c) Three** from

the 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
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 **[3]**

**11 (a)** Any **two** from

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

**(b)** Any **two** from

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

**(c)** Any **three** from

| | |
|---|---|
| decide on | software<br>hardware |
| design | input formats<br>output formats<br>file structures/tables<br>test plan<br>flow charts/algorithms<br>processing |

**[3]**

**(d)** Any **one** from

direct changeover
parallel conversion
phased conversion
pilot conversion

**[1]**

**12 (a)** Data type
Date is DATE, others are text/alphanumeric/string **one** mark

Field length
Date of birth = 8 **one** mark

Others = 30
E-mail = 40 **one** mark

Validation
Date is DATE, Picture/Format Check, Length Check, Range Check
Others are Type Check
Or all are Presence Check **one** mark

**[4]**

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

appropriate heading
all 6 fields present
clearly not a hand written form
sufficient spaces for data
icon/hyperlink/hot spot on screen

**[5]**

**(c)** Award **one** mark

two people can have same name

**[1]**

**(d)** **One** mark

e.g. change of address/phone number/e-mail address/marry

**[1]**

**(e)** random/direct access

**[1]**

**13 (a)** Any **three** from

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

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

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

**14 (a)** Award **one** mark each

large volume of data
off-line preparation
no immediate urgency for batch of data to be processed
instant processing/immediate results not required
computer used for other jobs **[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 (or backup)
re-run old master file with transaction file
follow disaster recovery plan **[2]**

**15 (a)** Any **four** from

3D views
rotation
modifying stored drawings
automatic calculations
cross sections
surface area
volume
simulation **[4]**

**(b)** Any **one** from

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

**16 (a)** 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]** |