UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2006 question paper

0418 INFORMATION TECHNOLOGY

0418/01   Paper 1   maximum raw mark 120

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*.

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 **A** Joystick
B Digital camera
C Memory stick
D Mouse
E Keyboard

  1 mark each   5 marks

2 Bar code reader
  Joystick

  1 mark each   2 marks

3   Control program ——————————→ typing letters

   Database ——————————→ automatic washing machine

   Measuring program ——————————→ storing records of books in a library

   Search engine ——————————→ monitoring rainfall in a weather station

   Word processor ——————————→ doing research on the Internet

  1 mark each correct arrow   5 marks

4 Evaluation
  Implementation
  Implementation
  Evaluation

  1 mark each   4 marks

5 Magnetic Stripe reader
  Keypad
  Bar code reader

  1 mark each   3 marks

6 6   6
  _50_ _ _ _ _ _ _ _ _ _ _ _ _ _ _   50 _ _ _ _ _ _ _ _ _ _ _ _ _ _
  RIGHT   RIGHT
  _ END REPEAT _ _ _ _ _ _ _   END REPEAT _ _ _ _ _ _ _ _
  RIGHT 180/LEFT 180/PENUP   PENUP
  FORWARD 60 _ _ _ _ _ _   FORWARD -60 _ _ _ _ _ _ _
  PENDOWN   PENDOWN
  REPEAT 4 _ _ _ _ _ _ _ _   REPEAT 4 _ _ _ _ _ _ _ _ _
  FORWARD 60   BACKWARD 60
  RIGHT 90 _ _ _ _ _ _ _ _   LEFT 90 _ _ _ _ _ _ _ _ _ _

  Each 2 statements 1 mark each   5 marks

**7** **(a)** Three methods and three corresponding advantages from:

Parallel running/implementation   1 mark
Information is not lost/always a second copy   1 mark
Phased implementation   1 mark
Still have most of system if things go wrong/ no expense of running two systems together
                                                                                                                   1 mark
Direct implementation/changeover   1 mark
Time is not lost/do not have expense of running two systems together   1 mark
Pilot running   1 mark
Still have most of system if things go wrong/ no expense of running two systems together
                                                                                                                   1 mark
   6 marks max

(b) Normal data is data which is within an acceptable range/ is usual for the situation   1 mark
Between 0 and 500 (<500 is acceptable as is an example in the correct range   1 mark
Extreme data is data which is at either end of a normal range of data   1 mark
0 and 500   1 mark
Abnormal data is data which is outside the acceptable range/ is of the wrong data type
                                                                                                                   1 mark
Any negative number or number greater than 500 or text example   1 mark

(c) Three from:
Program listing/algorithm
List of variables
File structure
Purpose of the system
Screen layouts
Print formats/report formats
Purpose of the program
Hardware requirements/information
Software requirements
Sample runs
Known bugs
Validation rules
Systems flowchart (1 mark for writing flow chart only)
Program flowchart   3 marks

8 Three from:
ROM cannot be changed
RAM can be read from and written to
ROM is read only memory and RAM is random access memory
ROM holds instructions that need to be unchanged such as BIOS/program cycles in a washing machine/program instructions in games such as gameboys, playstations etc.
RAM holds the work that is being currently done by the user
Ram is volatile/ROM is non-volatile

                                                                                                                   3 marks
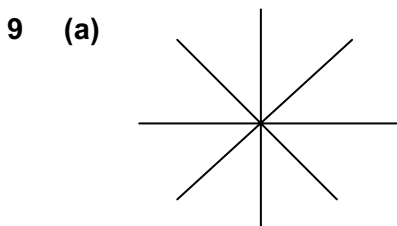
9 **(a)**   **(b)**

1 mark each   2 marks
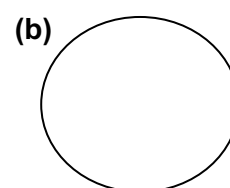
10 **(a)** Direct/random   **not** RAM   1 mark

(b) Harry Potter and the Philosopher's Stone   1 mark

(c) Must be device
Borrower - bar code *reader*/magnetic stripe *reader*   1 mark
Book - bar code *reader*   1 mark

(d) Quicker to input   1 mark
Less likelihood of errors on input   1 mark

(e) Two from:
check digit
length check
type check – all digits
existency check   2 marks

(f) Paperback or hardback   1 mark

(g) Text/alphanumeric/string   1 mark

(h) Code number   1 mark

(i) Five from:
computer reads a record from the book file
compares the date due back
with 27th May
if date due back is less/earlier than 27th May
using the borrower number
reads the corresponding record from the borrower file
address is read from record
mail merged letter/email is generated
otherwise reads next record and repeats above
until end of file   5 marks

11 Booking a flight using a computerised booking system
Withdrawing money from a cash machine

1 mark each   2 marks

12 **(a)** any cell from B4 to E7   1 mark

(b) five   1 mark

(c) D4-C4   1 mark

(d) centred   1 mark

(e) =SUM(E4:E7) / =E4+E5+E6+E7   1 mark

13 (a) Each field must have appropriate space for answers or be example
Personal data (name, address, phone, date of birth, etc.) 2 marks for 4 items, 1 for 3 items
else 0
Parent's name and phone number/ e-mail address
Space for minimum of two lines of medical condition(s)
Information fills the page and clearly be an input screen form   5 marks

(b) Three from:
Field Name
Field Type
Field Length
Key Field
Validation Check
Index
Input mask   3 marks

(c) Two from:
Data could be changed
Data could be deleted
Data could be distributed to anybody   2 marks

(d) Three from:
Password protect computer
Password protect file
Keep computer/removable media locked securely away when not in use
Encrypt data
Keep data on removable storage medium only
Anti-spyware
Firewalls   3 marks

14 (a) OMR   1 mark

(b) a disc   1 mark

(c) e-mail   1 mark

15 TRUE
FALSE
FALSE
FALSE

1 mark each   4 marks

16 **(a)** Five from:
Save spreadsheet
Load images from clipart
Download images from the Internet
Scan images
Upload images from digital camera
Load word processing software
Insert pictures/import pictures/copy and paste pictures
Insert spreadsheet/import spreadsheet/copy and paste spreadsheet/embed spreadsheet
Type in text
Insert file/paste chart
Format reports
Edit images

(Max three marks from 'images')   5 marks

(b) Moisture/humidity sensor   1 mark
light sensor   1 mark

(c) Sensors measure analogue quantities   1 mark
computers use digital data   1 mark

(d) Analogue to digital converter   1 mark

(e) Two from:
Computer readings are more accurate
Readings can be taken continuously
Humans cannot work without a break
Actions are taken immediately
Readings can be taken at night/during the holidays   2 marks

(f) Five from:
temperature read from temperature sensor
computer compares this temperature
with preset value
if lower computer/microprocessor switches heater on
if lower computer/microprocessor closes windows
if higher computer/microprocessor switches heater off
if higher computer/microprocessor opens windows
if still higher computer/microprocessor switches fan on
and repeats continuously   5 marks

17 **(a)** Two from:
flight simulations
driving simulations
nuclear power stations
simulating traffic flow
any civil engineering situation which can be modelled
1 mark for each   2 marks

(b) Two from:
too expensive to build real thing
too large a time scale required
wasteful of materials
variables can be easily changed/different scenarios can be easily used   2 marks

18 Input – symptoms are typed in/input direct from data logger/embedded computer
processing

expert system compares symptoms
with those in the knowledge base
using inference engine
using rules base
matches are found

Output – suggested/probable faults   4 marks

19 Eight from:

Customer – advantages
Don't have to waste time travelling (long distances to banks)
Disabled people don't have to travel to bank/leave home
Easier for customers to make transactions
Don't have to spend money on travelling expenses travelling (long distances to banks)
No embarrassment of having to ask for loans face to face
Can bank when banks are closed
Don't have to wait for post/immediate payments can be made
Less danger of mugging

Customer – disadvantages
Lack of socialising/social contacts
Hackers may intercept data and defraud customer
Deprived of personal touch
Easier for customers to mismanage accounts
Phone bills can increase
Without broadband other family members cannot use the phone
Cannot deposit/withdraw cash/money
More vulnerable to phishing
Customers must have a computer/Internet access/(basic) computer skills

Bank – advantages
Fewer cashiers needed – less spent on wages
Fewer branch offices needed – less spent on rates/rent
Less actual cash handled – fewer robberies
Less money spent on security staff

Bank – disadvantages
Lose customers due to lack of personal touch
Initial outlay on computers expensive
Greater risk of fraud so lose money
Need to retrain staff   8 marks

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