MARK SCHEME for the November 2004 question paper

9691 COMPUTING

9691/01   Paper 1 (Written Paper 1), maximum raw mark 90

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*.

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

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.

Grade thresholds taken for Syllabus 9691/01 (Computing) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:		
		A	B	E
Component 1	90	60	56	32

The thresholds (minimum marks) for Grades C and D are normally set by dividing the mark range between the B and the E thresholds into three. For example, if the difference between the B and the E threshold is 24 marks, the C threshold is set 8 marks below the B threshold and the D threshold is set another 8 marks down. If dividing the interval by three results in a fraction of a mark, then the threshold is normally rounded down.

November 2004

A AND AS LEVEL
CAMBRIDGE INTERNATIONAL DIPLOMA

MARK SCHEME

MAXIMUM MARK: 90

SYLLABUS/COMPONENT: 9691/01

COMPUTING
Written Paper 1

Question 1

(a)(i) Piece of hardware that allows data to be input to the processor. **[1]**

(ii) Piece of hardware that allows the processor to convey the results of its processing. **[1]**

(b) Input:

Bar code reader/laser scanner/light wand

Scans the barcode

recognises the thickness of bars

to allow interpretation of code number of item

Keyboard

to allow operator to input barcode/price/details

in case bar code reader cannot read barcode

to allow input of codes from items that have no printed barcode

Swipe card reader/chip reader

to read data from card (credit/debit/bank)

to send details of amount and customer to bank/computer

Scales

to measure weight of items

Customer keypad

to input PIN

Output:

Printer

to print till receipt

LCD

to show purchase details/cost of item

Buzzer

to confirm reading of code

(Any 2x2 input and 1x2 output, max 6) **[6]**

Question 2

(a) Large amounts of data

large number of customer statements to be produced

Data processing of similar type

simple calculations to work out balance

standard form of statement

Processor time available in quiet time

statements do not need immediate attention

uses large amount of resources

No human intervention

all details present on files so no outside interference

(Max 6) **[6]**

(b) Indexed sequential

file needs to be sequential for batch processing/match up with TF/ensure no records missed

file needs direct access for queries to be made on-line/access through layers of indexes or use of index followed by sequential search **[3]**

Question 3

Comments/annotation of code

the inclusion of comments within the code to describe what is happening/code not used or read by computer

Meaningful names

Names of variables/procedures/functions should be descriptive to make it easier to follow

Modularity

Easier to understand a number of small segments than a large one

Indentation

Highlights blocks of code in order to keep them together

(max 2 for each of 3 methods, max 6) **[6]**

Question 4

(a) Serial access is when records are stored in no particular order (chronological) Note: Not "unstructured" without a good explanation.

Sequential access implies records held in a logical order/technique such as a binary cut can be used/alphabetic or numeric or key order. **[2]**

(b)(i) Key field is read

hashing algorithm is applied to (it/something)

to give (relative) address of data

Data is looked for at that address

Recognition of problem over clashes

(1 per point, max 3) **[3]**

(ii) 1. Subsequent locations are read

until empty location found

record inserted at empty location

2. Existing record is used as head of list

pointers pointing to subsequent records with same hash values

new value inserted in free location and pointer from end of original list

3. Area of memory (bucket) set aside for overflow

any clashing record inserted into bucket

in next location in serial form

(Any 2 methods, max 2 per method, max 4) **[4]**

Question 5

(a) A set of rules/instructions

to allow communication between devices **[2]**

(b) Types of data transmission

is the transmission serial/parallel?

Duplex/half duplex/simplex

Baud rate

Both devices must talk, listen at the same number of bits per second

Otherwise bits may be missed/counted twice

Error checking

Is parity odd or even?

Is echoing back used?

Acknowledge messages to confirm accepted transmission

(max 2 per type, max 2 types, max 4) **[4]**

Question 6

(a)(i) Expert knowledge covering a small area

is brought together in a computer system

comprises knowledge base

rule base

inference engine

HCI

(1 per point, max 4) **[4]**

(ii) Sensors/mechanic used to input details like car type and age and exhaust gasses

Inference engine compares input with data in knowledge base

e.g. engine temp with what it should be

According to the rules in the rule base

e.g. is temp too high-what to do

Report to engineer on screen/automatic adjustment made

(1 per point, max 3) **[3]**

(b) Need to be trained

may not be able to learn new skills

new skills make worker more qualified

may earn more because skill level higher

Loss of skills (because of reliance on system)

(1 per point, max 2) **[2]**

Question 7

Questionnaires:

Adv: Large number of people can be asked quickly
        All employees perceive that they have had a say
Dis: Restricted responses possible
        Some may have difficulty completing them
        Few replies

Interviews:

Adv: Comments can be at length
        Can leave a prepared script
Dis: Lengthy
        Limits the number of views that can be sought
        Generalised answers

Group discussions:

Adv: Many people can air their views
        Cuts down the number of repeat views obtained in interviews
Dis: Some people may hog the discussion
        Some people's views may not be heard

Observation of methods/collection of data used, forms used

Adv: Shows present system not just views which may be clouded
Dis: People tend not to act in the way they normally do
        Data and forms tend to be seen in isolation

Collection of data used

Adv: A clear indication of the data used and the collection methods
Dis: Volume collected
        Data and forms tend to be seen in isolation

(1 per method, 1 per adv, 1 per dis, max 3 methods, max 9)   **[9]**

Question 8

(a)   Custom   A package specially written to solve a specific problem
                        contains all the features the business needs
                        including non standard ones
                        does not contain features that will not be used

         OtS   Pre written (generic) software
                        immediately available
                        shared development costs
                        ready pool of trained workers
                        will have been fully tested
                        compatible with other organisations
                        readily available help groups

         (1 per point, max 4 points per type, max 5)   **[5]**

(b)(i) Word processor
         to produce reports/write letters
         Spreadsheet
         to produce itemised invoices for customers/to 'do the accounts'
         Accounting package
         to do the accounts (only allow once)
         Database (MS)
         to manipulate customer/stock files
         CAD
         to design new buildings/interiors
         Graphical
         to produce advertising material
         Presentation
         to produce presentations for marketing
         Note: Reasons for graphical and presentation may be interchanged
         Communication software
         To use email/web/create intranet
         (Any 4 types, 2 each, max 8)   **[8]**

   (ii) Files produced can be merged
         e.g. spreadsheet can be placed in a report
         Common screen design/common toolbars/common icons
         makes it simpler for staff to learn
         (1 per point, max 2)   **[2]**

Question 9

(i)   Enter data twice

Computer compares the two entries

Rejects the code if the two entries do not match

Visual verification on-screen

(ii)   (Length check) all codes must contain exactly 6 digits

(Character check) all characters must be digits

(Range check) first 3 digits must be in range 000-100 or 300-600

(Existence check) code must match a key field on the file

(Check digit) one of the 6 digits is used to check the others for validity

(One per point, max 4 per dotty, max 6)   **[6]**

Question 10

Input to the system is of a standard type

Form prompts the user to ask standard questions

in the correct order

Ensures that information is in the correct format

Validation checks are easier to set up

Clear indication of where and what information is to be entered

Can automatically determine different routes dependent on entry

Labelled boxes to make system easy to use

Important data cannot be missed out

(1 per point, max 4)   **[4]**

Question 11

(a)   Back up is an extra copy to protect data in case it is corrupted

Archive is a copy (of the files) at a certain point of time for long term storage

        [2]

(b)   Customer file's hit rate reduced as number increases

many individual customers may only be 'one off', then record not used

Necessary to free up space

Stock file continually being changed

Necessary to store example states of file before lost forever

General point about possible need to retrieve data in the future

Replacing old files with new will lead to old files being archived

Taxation records

Management information

(1 per point, max 3)   **[3]**

(c) Either:

At regular intervals (No more than) 7 days

File is copied to tape (or alternative, not floppy)

Stored away from system

Multiple copies

Use of a transaction file

Or:

Grandfather/Father/Son or Ancestral Filing System

All stored sequentially

When file updated from TF

Each generation moves up

G and F are back-ups

(1 per point, max 4) **[4]**

Total [90]