UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

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*.

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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 20 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 r... 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]