

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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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**



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International Examinations**

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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]

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- (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]

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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]

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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]

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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]**

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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 dot, 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]**

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- (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]