UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

9691 COMPUTING

9691/12 Paper 1 (Written Paper), maximum raw mark 75

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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UNIVERSITY of CAMBRIDGE
International Examinations

1 (a) (i) – The physical/electronic parts of a computer system
Parts you can see /touch no mark

(ii) – Sequence of instructions/programs [2]

(b)
– Printer/to print till receipt
– Beeper/to indicate correctly read barcode/ error reading barcode
Speakers/to give instructions to customer
– LED/LCD screen to show information about purchase

(2 per –, max 4) [4]

(c)
– Sound/indicates barcode properly read without operator diverting attention from job
– sound to indicate terminal is free
– Video image or screen output or soft copy/to allow shopper to check goods and prices as they are input to system
– Receipt or printout or hard copy/to allow shopper to check payments and shopping at home, proof of purchases.

(2 per –, max 6) [6]

(d) (i)
– Producing leaflets/flyers/brochures/posters
– Using frames to divide up content/editing features/...
– combining images and text [2]

(ii)
– Producing presentation for an audience, perhaps for head office/to produce training materials
– for advertisements
– Use of multi-media to maintain interest in presentation.

*Don't accept same point in **(i)** and **(ii)***
(1 per –, max 2) [2]

2 (a)
– Manager must provide knowledge of...
– and requirements of business as...
– they are expert in how the business works.
– Analyst provides knowledge of what is possible...
– particularly within confines placed by manager/e.g. budget
– If not properly defined analyst will solve the wrong problem
– Manager's requirements and analyst's understanding must match
(1 per –, max 4) [4]

(b) (i) Evaluation carried out by:
– Functional/black box testing
– Testing against the agreed objectives
– Testing against user requirements / specification
– Testing done by software house/alpha
– Testing done by users/beta

(ii) – Important to analyst to ensure that there is evidence that all objectives have been met
– or will not be paid / ruin his reputation
– Important to manager to ensure that there is evidence that all objectives have been met
– or system may prove unsatisfactory in the future.
(1 per –, max 3 points per dotty, max 4) [4]

3 (a) (i) – The symbols recognised/used by the computer
– Often equates to the symbols on the keyboard

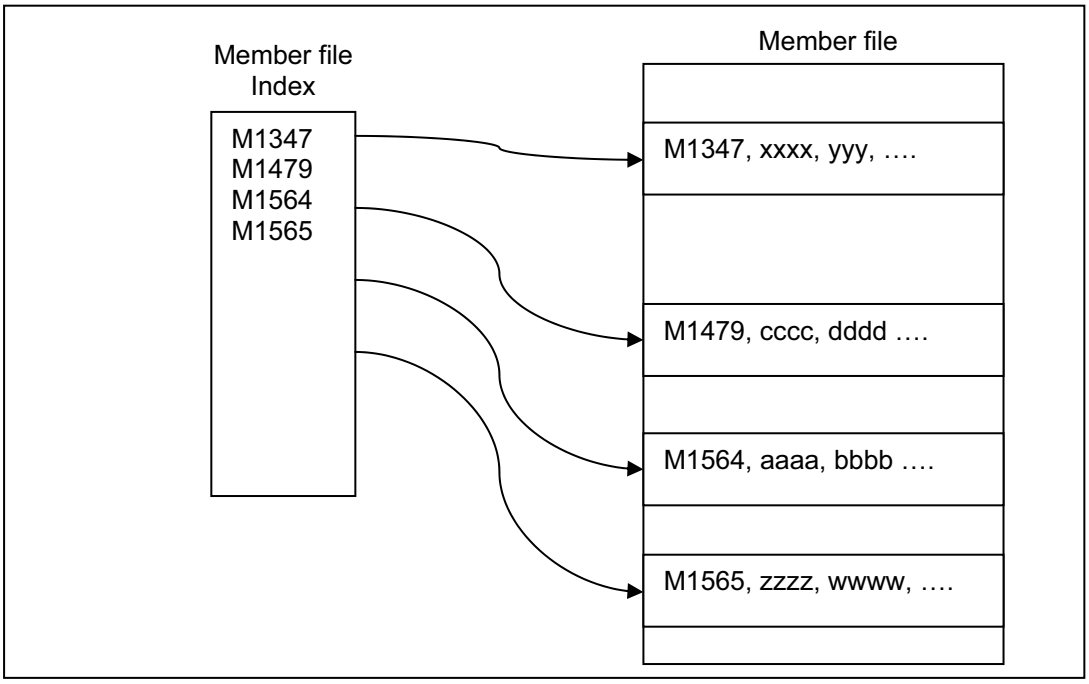
(ii) – Represented by a set of bits...
– Unique to that character
– The number of bits needed is equal to 1 byte / 2 bytes
– ASCII/Unicode is a common set

(1 per –, max 3 per dotty, max 4) [4]

(b) – Bits are used to store the correct binary representation of the integer
– Leading zeroes included to complete required number of bits
– Standard number of bits irrespective of size of integer
– Concept of short and long integer dependent on sizes of integers
– Two's complement used to represent negative numbers

(1 per –, max 3) [3]

4 (a) – IDs/indexes kept in sequence
– Attached to each is a pointer...
– which points to the data for that ID
– Possible to use multiple indexes



(1 per –, max 2) [2]

(b) (i) – Digits in ID are used as input...
– to arithmetic algorithm
– Result is the location of the data (or pointer to it)

(ii) – When 2 IDs hash to the same value
– Locations read sequentially from clash until correct value found..
– or free location, in which case error.
– or a linked list structure
– stored in overflow area with tag or pointer to it
– a second hashing algorithm is applied

(1 per –, max 3 per dotty, max 4) [4]

5 (a) (i) – Manages the execution of instructions
– Fetches each instruction in turn
– Decodes and synchronises its execution...
– by sending control signals to other parts of processor [2]

(ii) – Stores program <u>in current use</u>
– Stores data <u>in current use</u>
– Stores parts of OS <u>in current use</u> [2]

(iii) – Carries out arithmetic operations
– Carries out comparisons
– Acts as gateway in and out of processor

(1 per –, max 2 per dotty, max 6) [2]

(b) – temporary storage area
– Data transferred from primary memory to buffer (or vice versa)
– When buffer full, processor can carry on with other tasks
– Buffer is emptied to the hard disk
– When buffer empty, interrupt sent...
– to processor...
– requesting more data to be sent to buffer.
– according to priorities
(1 per –, max 5) [5]

6

A	B	C	D	OUT
0	0	1	0	0
0	1	1	1	1
1	0	0	1	0
1	1	0	1	0

Mark points:
– Column C first two values
– Column C last two values
– Column D first two values
– Column D last two values
– OUT first two values
– OUT last two values [6]

7 **Colour**…
- Colours should provide suitable contrasts
- should be meaningful e.g. red for danger
- reference to colour blindness / epilepsy

Layout...
- should use whole screen...
- important information in top left hand corner/centre of screen
- big buttons for ease of navigation
- similar content grouped together
- consistent layout when moving from screen to screen

Content...
- must be relevant...
- must be understandable
- must be restricted so no information overload

(1 per –, max 2 per section, max 6) [6]

8 **(a)**
- LAN over short distances/buildings/site // WAN geographically remote
- LAN uses own communication medium/WAN uses third party
- LAN more secure/WAN more open to attack

(1 per –, max 2) [2]

(b) **(i)**
- Individual bits sent one after another/along single wire
- can be used over long distances
- Less chance of corruption/less chance of bits having order changed [2]

(ii)
- a byte is sent simultaneously / at the same time along 8 wires
- Much faster transmission rate [2]

(c)
- 01101101/First byte
- The other three all have an even number of ones/even parity
- This byte has an odd number of ones [3]

Second and third marks depend on first mark

9 **(a)**
- OS will only allow one user at a time to use the computer
- Each approved user is identified by a user ID
- multi-tasking
- Provides security for user files/user profiles

(1 per –, max 2) [2]

(b)
- Each user given short processor time/time slice
- In turn/so all users serviced in one rotation
- Flags used to stop waste of processor time if terminal has nothing to do
- Priorities used to allow some terminals more regular time slices...
- or longer time slices
- different users' data/programs are stored in different areas of main memory

(1 per –, max 4) [4]