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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 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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1 **(a)** **(i)** To pass data to a computer/for processing

(ii) To give information/data from the computer/after processing

(b)
– Bar code reader/to input ID number of goods from bar code
– Key board/key pad/to input ID number if bar code is damaged
– Scales/to weigh produce
– touch screen/to choose items
– chip + PIN / bill payment
– magnetic stripe reader / pay bill

(2 per –, max 2–, max 4) [4]

(c)
– Each terminal given a small amount of (single) processor time...
– before moving to next terminal
– Will eventually get back to first on a round robin basis
– Use of flags to indicate if processor time is required
– Some terminals may be of a higher priority and hence have more time.
– several users use the system at the same time
– users need login name and password

(1 per –, max 4) [4]

2 **(a)**
– Collection of information about the problem / or by example, e.g. questionnaire…
– Analysis of the information collected about the problem
– Creation of diagrams to illustrate areas of problem e.g. Data flow
– I/O requirements / Production of a requirements specification
– Consideration of different methods of solution
– Full user involvement in order to ensure that analysis relates to problem/feedback
– objectives of the system
– hardware + software requirements

(1 per –, max 4) [4]

(b) **(i)**
– Old system stopped being used (one day) i.e. immediate changeover
– new system starts being used the next
– no going back once change is made

(1 per –, max 2) [2]

(ii)
– One part of the new system is introduced
– Other parts wait until the first part is proved to be effective/only one part of system can fail / critical area introduced first + reason / least critical area introduced first + reason [2]

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3
– Need for bright contrasting colours ….
– …to gain attention
– Use of very large font for numbers...
– …limited content
– use of music or multimedia …
– … gives background to the images
– use of sound/voice
– … because do not read well

– use of Animation/video ….
– ….to maintain interest / feedback / reward
– voice recognition …
– … to input responses
– easy navigation …
– … via touch screen

(1 per –, max 5) [5]

4 Set-up
– Data collected from experts in the field...
– and from resource material like books/encyclopaedias/...
– create user interface
– Data stored in the knowledge base
– create inference engine
– Rules governing the use of the data are stored in the rules base
– test the system against known outcomes max 4

Use
– Questions asked about the sample as part of the interface
– Knowledge base is searched for answers to questions posed.
– inference engine used …
– Results are presented on screen/given to user along with...
– Probabilities in percentage form
– Reasoning behind the results given / explanation system max 4

To a max of 6 [6]

5 **(a)** **(i)**
– Set of data items of the same type
– Stored together, physically
– Under a common name (using a pair of indices)
– Two dimensional array is a table / rows + columns

(1 per –, max 2) [2]

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(ii)
```
FOR I = 0 TO LENGTH
    FOR J = 0 TO BREADTH
        ARRAY (I,J) = 0
    NEXT J
NEXT I
```

Mark points:
– Two nested loops
– Each uses one of the indices as counter
– Correct conditions on loops
– Each loop will initialise one cell in table/Correctly identified...
– to zero.
(1 per –, max 4, accept any form of presentation of mark points) [4]

(b)
– dimension an array
– Data input to the stack is placed at pointer/on top
– Pointer reset to top of stack/incremented
– Data read from stack is read from top of stack
– Pointer is decremented
– Check always made for stack full/empty
– stack is LIFO structure
– Example of a LIFO structure
(1 per –, max 4, accept all points if shown on diagrams) [4]

6 **(i)**
e.g. – Hard drive/tape
e.g. – Storing OS/Software/User files/Back-up (for tape)/transaction file [2]

(ii)
e.g. – Pen drive/Memory card
e.g. – Take data from one machine to another/use in camera/mobile phone
– use as back-up/backing store [2]

7 **(a)** **(i)**
– prompts questions to ask
– Ensures all details are taken
– Allows for ease of validation routines/standard entry / reduces entry error
– All data entered is relevant
– Allows use of drop down lists and radio buttons
(1 per –, max 3) [3]

(ii)
– OrderID used as input
– to a hashing algorithm mathematical calculation
– Result gives position of order in file
– Recognition of possibilities of clashes
– Method for dealing with clashes
(1 per –, max 3) [3]

(b) **(i)**
– Redundant data / Little used data/ancient data...
– removed to separate, long term storage...

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(ii) – to free up space on main storage
– Data no longer necessary because order has been met
– Kept in case there is a query in future
– legal requirement to keep data
– to speed up searches/system
(1 per –, max 4) [4]

8 **(a)** Hardware: 2 from: Server/Hub/Switch/cabling/terminators/NIC

Software: Network Operating System/Network versions of software
Network management system
Network card driver [3]

(b) – (Groups of) bits/bytes...
– are added together...
– ignoring any carry out of the byte
– Total is sent with data
– Sum is duplicated at receiving end
– to see if same result is obtained
(1 per –, max 4) [4]

(c) **(i)** – For producing text documents like…e.g.
– letters to customers
– Mail merge documents…
– to send personalised letters to customers
(1 per –, max 2) [2]

(ii) – For manipulation and storage of numeric data e.g.
– Keeping accounts of firm
– what-if planning
– Calculating building estimates based on established values
– produce graph and charts
(1 per –, max 2) [2]

(d) – stock entering/leaving warehouse identified using BAR CODE
– look up on system to find item
– error if item NOT found
– if found update stock amount
– compare amount against <u>minimum</u> stock level
– if less than minimum stock level set flag to re-order
– regular check for (set) flags to create orders
(1 per –, max 5) [5]

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9 (a)

A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

(1 for C column and 4 for S column) [5]

(b) – Adds together two single bits/A half adder [1]