UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIO

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the May/June 2010 quest

for the guidance of teachers

9691 COMPUTING

9691/12 Paper 12 (Written Paper), maximum raw mark 90

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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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1 **(a)** **(i)** -Data held in ROM is permanent/the data in RAM can be
-ROM is not volatile, RAM is volatile
-ROM is normally smaller than RAM
(1 per -, max 2)

(ii) -Boot/Bootstrap program (Not: Bootfile)
-Must be available when computer is turned on/protects b

(b) -Cables or wireless/to carry signals from one machine to the
-N.I.C/to interface between cable and motherboard
-Modem or Router/to connect two computers on a WAN
-Hub or switch/to connect computers in a star LAN
(2 per -, max 2 -, max 4) [4]

2 **(a)** Input:
-Bar code reader of some sort/to input bar codes to system automatically
-Key board or Touch screen/to input code if not readable.
-Scales/to weigh loose produce sold by weight
-Chip and Pin reader/to allow for card payment
Output:
-Screen/to show current state of bill
-Buzzer or Speaker/to make audio signal that signifies successful reading
-Printer/to print receipt
Storage:
-Hard disk/fast access and amendable/to store software/stock files
-CDRW or DVDRW or flash memory stick/to back up the file
(2 per -, max 4 -, only one group to have two -, max 8) [8]

(b) -Barcodes read whenever goods bought/sold
-If new stock then number in stock is incremented
-If stock sold then number in stock is decremented
-Software checks number in stock against reorder number...
-after every transaction
-When number in stock is below reorder level (then order created)
-Note that order has been made, stored as Boolean/until delivered
-Linked to supplier table for automatic ordering/order list produced for manager
(1 per -, max 6) [6]

3 -Digital camera takes picture
-by means of array of light sensitive pixels
-Picture stored in computer memory...
-or on flash memory stick/hard disk for computer transfer in...
-JPEG format (or other)
-Displayed on screen to allow...
-manipulation by suitable image editing software.
-Sent to inkjet printer to print on shirt.
(1 per -, max 6) [6]

4 **(a)** -Set of rules...
-to control the transmission of data

(b) **(i)** Packet Switching:
-Blocks of data find own way through network and...
-are reordered when they reach the destination
Circuit Switching
-Route is reserved for the duration of the data transfer
-Message simply needs to be reconstructed at destinatio
General points:
-The transmission of data from one node to another over a network
-Message is split into (standard sized) blocks of data
-each has label attached showing destination and block number
(1 per -, max 5) [5]

(ii) Advantage:
-Difficult to intercept message/network not tied up/all possible routes available
Disadvantage:
-Message must be reordered at destination/message sent at speed of slowest block [2]

5 **(a)** e.g.

(i) Produce information booklets for patients

(ii) Make presentations on health topics to audiences, e.g. schools

(iii) Store patient records

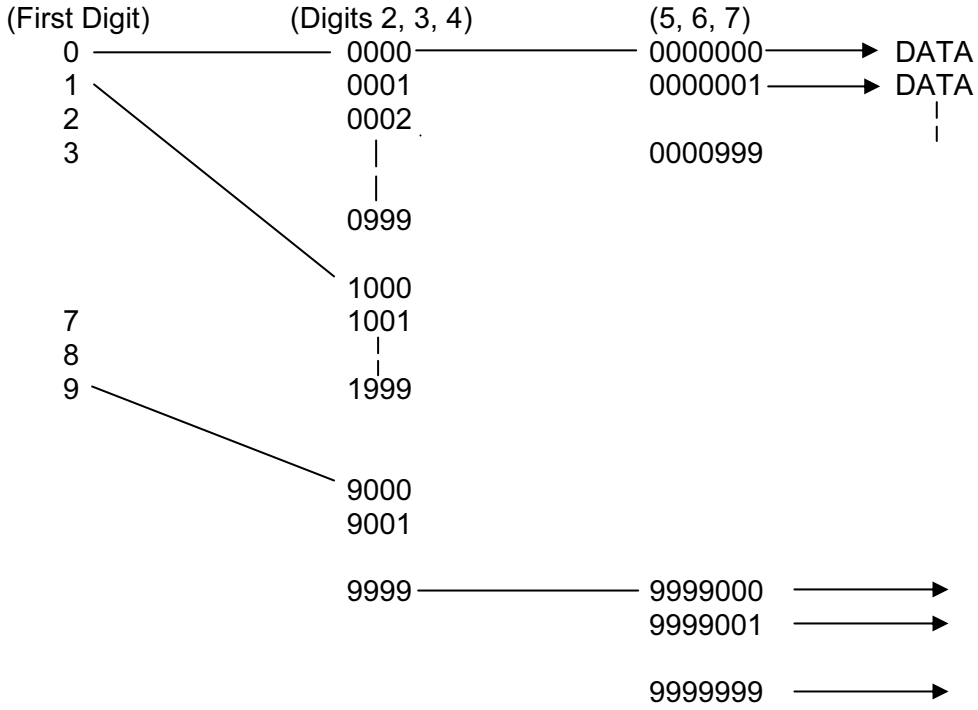
(iv) To send orders to drug companies [4]

(b) e.g. -Automated filling of drug containers
-This is a one-off problem/off-the-shelf software will not exist [2]

(c) -Standard letter is written with data markers/fields
-Database of patients searched with the following criteria
-Doctor=Dr. Mun
-Date of last appointment >=October 1st
-Selected patients have their details input to data areas/fields on standard letter
-May be done electronically resulting in emails being sent.
(1 per -, max 5) [5]

6 **(a)** -Different requirements of enquiry and order completion (war
-Warehouse requires all records to be accessed in some orde
-so that none are missed
-The other requires direct access (indexed)...
-to allow for fast response to customer with telephone query.
(1 per -, max 4)

(b) e.g. Base Index Second level Third lev



Mark Points:
-Accurate diagram used to illustrate at least 2 of the other mark points
-Use of Base index (1 or 2 digits)...
-pointing to second level index
-Indexes shown to be sequential
-Finally pointing to data (block).
(1 per -, max 4, max 3 if no diagram but answer is prose) [4]

7 -Backups taken regularly/archive at wider intervals
-Backup will be (e.g.) daily...
-because any corruption will lead to loss of orders/revenue/client dissatisfaction/valuable data which the company cannot afford to lose
-Archiving is removal of redundant/little used data...
-To free space on medium/tidy up index/speed up direct access
-Back up is used as security/requires whole file including structure
-Archive is used for statistics/comparison/data requirements like tax office/tends not to include structure as may never be required/long term queries
-Transaction file mentioned
(1 per -, max 5) [5]

8 (a) (i) -Form based interface
-Contains areas to be filled in with information
-Data must be input/in order
-May have drop down lists/radio buttons
-Will have prompts for operator so correct information is
(1 per -, max 3)

(ii) -e.g. Bank account number
-Restrict number of staff who have access...
-by using passwords/access rights
-Use firewall to stop hackers/outside access to system/do not allow on a WAN
-Control physical access by only allowing data on limited machines/locking files away when not in use
-Encrypt data on files.
-Make files RO
(1 for first point, + 4 more points, max 5) [5]

(b) (i) -Passive, is a system which provides information but the information cannot be altered by the user.
-e.g. Details of items on offer
-Interactive is a system which allows the information to be altered by the user.
-e.g. User can make an order which will change the information stored on the customer file.
[4]

(ii) -Corrective/when bugs or errors are found in the software which must be corrected
-Perfective/to improve the software e.g. adding a search engine to the site.
-Adaptive/to alter the software due to some external influences
e.g. Tax rates might change which would require the price calculated to be altered.
(2 per -, max 6) [6]

9 (a) e.g.

```
PROCEDURE INVOICE
    INITIALISE TOTAL
    WHILE NOT END OF ORDERS, DO
        READ ORDER, AMOUNT
        OUTPUT ORDER, AMOUNT
        TOTAL = TOTAL + AMOUNT
    ENDWHILE
```

Mark Points:
-Naming of INVOICE in some way
-Initialise total
-Use of WHILE loop
-Read order details and amount owing, inside loop
-Condition statement for amount owing > 0
-Output order details and amount owing, inside loop
-Cumulative total
-Output running total outside loop
(1 per -, max 4) [4]

(b) e.g.
```
WHILE NOT END OF CUSTOMERS, DO
    READ CUSTOMER RECORD
    READ DISCOUNT
    OUTPUT CUSTOMER DETAILS FROM RECORD
    PROCEDURE INVOICE
    IF DISCOUNT = "GOLD" THEN FINAL = TOTAL * .8
        ELSE IF DISCOUNT = "SILVER" THEN FINA
            ELSE FINAL = TOTAL "* .95
        END IF
    END IF
    OUTPUT TOTAL
    OUTPUT "AMOUNT AFTER DISCOUNT" = FINAL
ENDWHILE
END
```

Mark Points:
-Reads all records, even when they are zero
-Reads Discount
-Reads and Outputs customer details, before...
-INVOICE (not repeat of statements) (f.t.)
-Correct nested condition statements (or equivalent)...
-using .8, .9, .95 (or equivalent)
-Output TOTAL and FINAL
-Output explanation
-Well laid out.
(1 per -, max 7) [7]