UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Diploma Advanced Level

MARK SCHEME for the October/November 2009 question paper for the guidance of teachers

CAMBRIDGE INTERNATIONAL DIPLOMA IN COMPUTING

5216 Computer Systems, Communications and Software, maximum raw mark 90

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UNIVERSITY of CAMBRIDGE International Examinations

1 **(a)** -Spreadsheet
-to keep the accounts/forecast planning/stock records/sales transactions/invoices
-DTP/graphics/publishing software
-to produce promotional leaflets/posters
-Database
-to store customer records/stock file/supplier file
-Website authoring
-to produce a website for the garage
-Presentation software
-to create presentations for meetings/open days for new models
-Accounting/Payroll
-to produce accounts of business/pay for workers.
-image editing software
-to edit photos of cars (for use on website)
-stock control software
-for use in parts department
(1 per -, max 3 pairs, max 6) [6]

(b) -standard letter is produced…
-with fields ready to accept data.
-Database of records of cars is searched…
-for all cars whose last service is >10 months < 12 months ago/or sensible comment about search criteria.
-Details taken from record and inserted into copy of letter for printing, like…
-Customer name/address/car model/registration/type of service…
-note made that letter has been sent
-mailmerge
(1 per -, max 4) [4]

2 **(i)** -Divides up the surface of the disk
-to create areas of disk that can be used for different purposes/prepare disk for use/delete all from disk.

(ii) -To control messages to and from the disk and OS/to make messages understandable between the disk and the O.S.
-to install the disk/prepare it for accepting data after wiring up.

(iii) -Changes size of files while maintaining data integrity
-to decompress/compress video/allows faster download/allows more files to be stored

(iv) -To ensure files imported to system are virus free
-to check the video files before saving them to system.

(Up to 2 per dotty, max 8) [8]

3 (a) (i) A piece of hardware which allows the user of a computer system to give the system data.

(ii) A piece of hardware which will keep the data even when switched off/to be used at a later time.

(iii) A piece of hardware which allows a computer system to tell a user information.
(1 per dotty) [3]

(b) (i) -The bar code is read by a laser scanner/wand
-The light is reflected back so that the bars can be identified
-Combinations of light and dark bars
-Pairs of bars
-different thickness/width
-stand for different characters
-These characters, once read, are subject to validation checks/check digit calculation.
(1 per -, max 3) [3]

(ii) -Sound/Beep
-to signify that bar code has been accepted
-Hard copy
-to provide portable documentation of sale/receipt
-LCD/Screen display
-to give instant report of price from stock file
(1 per -, max 2 pairs, max 4) [4]

4 (a) (i) -Instructions typed in…
-at the prompt
-Commands may be combined to make a command sequence
-User must know/understand commands
(1 per -, max 2) [2]

(ii) -e.g. Technician who maintains a computer system
-Requires access to whole system/faster access because done directly
-e.g. application such as telnet [2]

(b) (i) -spaces for input
-in strict order
-explanatory comments on screen
-use of drop-down lists/tick boxes/radio buttons
(1 per -, max 2) [2]

(ii) -e.g. ordering goods on-line/applying for membership on-line…
-ensures all relevant information is collected [2]

5 (a) -Each worker has an employee number which can be stored in a logical order
-Matched easily with sorted TF
-So that there are no duplications of people's wages.
-So that no worker is missed
-every worker needs to be accessed.
(1 per -, max 2) [2]

(b) (i) -Large number of records in file…
-make access to an individual record time consuming
-worker will not be satisfied/worker will not get immediate response
(1 per -, max 2) [2]

(ii) Either
-Indexed sequential
-Because it allows both sequential and random/direct access to data
-Because it allows fast access to data while maintaining sequential nature
Or
-Random/direct access
-Because it gives direct access to data/faster access to data
-because immediate access is allowed (while payroll may be produced serially).
(1 for type, 1 for justification) [2]

(c) -Serial
-Because no logical order to input of data
-Records/fields/items input with no logical sequence to file/chronological order.
(1 for type, 1 for justification) [2]

(d) (i) -The production of the payroll
-Because all processing similar/large amount/can be done at off-peak time/data is collected before processing. [2]

(ii) -Individual enquiry made by a worker
-Time critical/must be done while worker waits/changes may be time critical. [2]

6 (i) -Manages execution of instructions
-Fetches instructions in sequence/decodes them.
-Uses control signals to manage rest of processor.
(1 per -, max 2) [2]

(ii) Stores:
-Program instructions;
-Data associated with program;
-Parts of O.S. (currently in use).
(1 per -, max 2) [2]

(iii) -Carries out all arithmetic.
-Carries out logic operations.
-Acts as gateway to and from processor.
(1 per -, max 2) [2]

7 **(a)** -Two sides to problem which must contribute to the problem definition
-The owner of the problem and the system analyst
-They must agree or…
-the result will be a solution to the wrong problem.
(1 per -, max 2) [2]

(b) -Interviews
-allow a departure from a set script
-Questionnaires
-allow large participation in short space of time
-Observation
-can see faults in present process first hand
-Documentation
-see what people are used to and how to improve docs.
-Meetings
-allow large number of people to have their say in an unstructured environment.
(1 per -, max 2 groups, max 4, advantages are examples) [4]

(c) -Success of system must be measured against the original objectives
-otherwise system may be considered to be working despite not satisfying objectives
-Payment based on number of objectives satisfied
(1 per -, max 2) [2]

8 **(a)** -LAN has computers geographically close, same building/WAN has computers geographically remote.
-LAN connected using own communication media, cable/WAN relies on external communication media, telephone line.
-LAN more secure from hacking/WAN may have security problems [2]

(b) **(i)** -Each client/computer at end of cable
-each has individual cable to hub/server/switch
-Peripherals like printers are shared.
(1 per -, max 3) [3]

(ii) -Advantage: Reliability/taking machine off or adding new is easy/high security/fewer collisions
-Disadvantage: More expensive due to large amount of cabling/extra hardware/hub failing means network fails.
(1 per -, max 2) [2]

(c) **(i)** To ensure that both are on and ready for communication/to ensure that both are using same protocol. [1]

(ii) -Data sent to buffer from primary memory
-Processor can continue with other tasks
-Data downloaded from buffer to file server
-When buffer empty, interrupt sent to **processor** requesting refill of buffer
-Interrupt added to queue and dealt with when top of queue/interrupt dealt with on receipt by processor.
(1 per -, max 4) [4]

9 **(a)** -Anti-glare screens/low radiation screen
-to protect eyes and reduce headaches
-Wrist supports
-to protect against muscle strain/RSI/ulnar neuritis
-Concealed cables
-to eliminate tripping over wires
-Ensure screens are at correct height/keyboards in correct position
-Avoid muscle problems/stiff neck/back problems.
(Up to 2 per measure, max 2 measures, max 4) [4]

(b) -Do not want people to see tax details/personal financial details
-May lead to targeting of property because of wealth of owner
-May lead to comparison with others/difficulty with relationships with friends/colleagues
-May lead to blackmail if details wrong.
-concern that details may be incorrect
-leading to incorrect tax demands
-identity theft
(1 per -, max 20) [2]

10 **(a)** e.g.

```
INPUT I
LET P = I – 500
IF P < = 0 THEN REPORT "NO TAX TO PAY"
     ELSE T = P *.1
          REPORT "TAX TO PAY =", T
END IF
```

Mark points:
-Input of I to algorithm
-Calculate taxable income
-Correct condition for no tax
-Report no tax to pay
-Calculation of tax iff there is some to pay
-Report tax to pay iff there is tax to pay.
(1 per -, max 5) [5]

(b) -Do not indicate what they stand for/will make maintenance/debugging difficult to do.
-e.g. INCOME and TAX_TO_PAY (Any sensible)
(1 per -, max 2) [2]

(c) -Incomes kept in suitable data structure e.g. array (so that they can be read in order into algorithm)
-Loop structure (Repeat, While or For)
-With end condition based on rogue value of I (to indicate end of values) or end of file/ number in file
-Outputs will either be identifiable by inputting (and outputting) person ID with Income/OR will be output to data structure so that ID can be determined by position in data structure.
(1 per -, max 3) [3]