MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

9691 COMPUTING

9691/11   Paper 1 (Written Paper), maximum raw mark 75

1 (a) (i) – ROM is non volatile/RAM is volatile
– Data held on ROM cannot be altered/Data held on RAM can be altered

(1 per –, max 2) [2]

(ii) – Bootstrap/boot program / BIOS
– ...because it must be present when the computer is switched on

[2]

(iii) – Loads an operating system ready for use/runs start up sequences (including POST)

[1]

(b) (i) A peripheral which can accept data/allows data to be entered to a computer/processor as electrical pulses

[1]

(ii) A peripheral which allows information to be reported by a computer after data has been processed/in human readable form (or in a form suitable for reprocessing by the computer at a later date)

To give information from the computer/after processing [1]

(c) Input:
– <u>Braille</u> keyboard
– so that the secretary can feel the characters on each key
– Microphone
– so that the secretary can use voice recognition software to write documents
Output:
– Printer/Braille printer
– to produce documents for sending to other members of the league/for the secretary to keep
– Speakers
– so that documents can be read to the secretary using voice synthesiser
Storage:
– Hard drive/zip drive / CD, DVD, Blu-ray
– to permanently store the documents produced by the secretary
– USB flash memory stick/Pen drive
– to take back-ups of the files held on the hard drive in case of corruption

(1 per –, max 3 pairs, one from each category) [6]

2 **(a)** **(i)** The systems software which controls the operation of the computer.

[1]

   (ii) Software to carry out a task which would need to be done if a computer was not available.

[1]

(b) **(i)** – Custom-written is software which is written in response to a user's specific requirements.
– Off-the-shelf software is written to respond to the requirements of a group of problems that are similar/is available to buy / is immediately available. [2]

   (ii) – Immediately available
– tested with a wider range of users / tried and tested
– Ready trained work force
– Shared cost of development
– greater range of support / help
– Compatible with other software from same manufacturer/with software of other people/ organisations

(1 per –, max 4) [4]

(c) **(i)** To write the report / to enter text into a report / essay [1]

   (ii) To store rainfall readings and make calculations/predictions about the readings / produce charts/graphs [1]

   (iii) To produce the final report in a presentable form/ready for publication to combine text and graphics (easily) [1]

(d) – Only one user is allowed access <u>at any one time</u>
– Users are allocated disk space to store their files, accessed by passwords
– Allows individual users to have different access rights to files and software
– Will appear to run more than one piece of software at a time.../ or by example
– ...by allowing each piece of software a slice of processor time

(1 per –, max 4) [4]

3 TRANSACTION PROCESSING

    (i)   immediate updating of files / immediate response to user   [1]

    (ii)   – e.g. airline booking / any booking system   [1]

    (iii) – avoids double booking / overbooking
         – confident booking has been made because of immediate response   [2]

CONTINUOUS MANUFACTURING PROCESS / MONITORING

    (i)   where the current output affects the next input   [1]

    (ii)   – e.g. any control/ monitoring application   [1]

    (iii) – needs response in a reasonable time/immediate
         – safety implications needing reasonable response   [2]

4 **(i)** – Reader reads the <u>position</u> of a mark on the paper document
          – The position is then translated into information
          – light reflected more from no mark / less where mark made
          – e.g. School register/lottery ticket/...

        (1 per –, max 3)   [3]

    (ii) – Reader reads <u>shape</u> of character
          – Shape compared with <u>library of shapes</u> stored in computer
          – e.g. Document reader for blind/to input documents to word processor/digitising handwriting / copy from a hard copy into a computer / to read characters on a cheque

        (1 per –, max 3)   [3]

5   – Is the technology/hardware available to solve the problem
      – to determine if the new system is viable
      – Is it economically possible to produce the solution
      – Will the end product be so expensive that it bankrupts the company
      – Are the social effects likely to be too damaging
      – Are there enough skilled people available to make the solution operate effectively / e.g. is cost of training employees too high
      – can the new system be created in a time effective manner
      – Is the solution legal?
      – is it operationally feasible?

   (1 per –, max 5)   [5]

6 – reference to safety to avoid accidents
– interface design to ensure smooth running
– interface design reflects needed level of detail / is relevant
– some information is time critical / safety critical
– Use of colour should be consistent
– Use of position for different types of information must be consistent
– Use of sound / flashing interface in a critical situation
– Input should be minimal
– any necessary input should be straight-forward

(1 per –, max 6) [6]

7 (a) (i) 0100010110 [1]

(ii) 172 [1]

(b) (i) e.g. 'A'/"A"/"5" [1]
e.g. 01012012 / 20120101 [1]

(ii)

Field name	Data type	Reason
StudentName	String/text/alphanumeric	Non-numeric characters
NumberOfPrizesWon	Integer/int/Short/Byte	Must be a whole number and will be small in size
AverageExaminationMark	Single/Real/Float	Must allow fractions if they are necessary though great precision not necessary

If wrong data type do NOT allow reason

[6]

8 (a) (i) – share devices
– data/files/software
– can be used for communication between users/email
– to remotely manage computers [2]

(ii) – In parallel a group of bits (often a byte) are transmitted at the same time
– down multiple wires [2]

(b) Packet switching
– data is split into packets
– packets may travel through different paths/routes
Advantages:
– difficult for an outsider to be able to hack into a message
– Does not tie up a particular route
– adaptive routing
Disadvantages:

– Message is only received as fast as the slowest packet
– Packets need to be <u>reordered</u> on arrival
– slow to spot missing packets

Circuit Switching
– data is split into packets
– a single route is reserved to transmit the packets (data)

Advantages:
– Packets do not need to be reordered on arrival
– guaranteed bandwidth

Disadvantages:
– Path is tied up for the duration of transmission
– path must be set up which takes time

(1 per –, max 6)   [6]

9   (a)   A   B │ X
          0   0 │ **1**
          0   1 │ **0**
          1   0 │ **0**
          1   1 │ **0**

(1 mark for the 1,0 and 1 mark for 0, 0)   [2]

    (b)   A   B │ C   D│ Y
          0   0 │ **0**   **1**│**0**
          0   1 │ **1**   **0**│**0**
          1   0 │ **1**   **1**│**1**
          1   1 │ **1**   **0**│**0**

(1 mark for each row).   [4]