MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

9691 COMPUTING

9691/01   Paper 1 (Written Paper 1), maximum raw mark 90

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1 (a) (i) To allow the user to give the computer data/change data into computer understandable form

(ii) To allow the computer to give information/communicate with the computer/to change information from computer into human understandable form

(iii) To keep data while the computer is not using it
(1 per dotty) [3]

(b) -Black and white laser
    -e.g. Use in office to produce letters
    -Produces high quality/speedy so does not develop large queue on a LAN
-Colour laser
    -e.g. To produce reports for a meeting
    -High quality outputs/can produce large quantity quickly
-Dot Matrix
    - e.g. Print receipts at checkout/tickets on railway
    -Produces more than one copy at a time, one for customer + one for shop
-Inkjet
    -e.g. Doing homework at home
    -Relatively cheap and slowness does not matter
-Plotter
    -e.g. Produce architect's plans
    -Precision drawing tool
-Braille printer
    -Producing documents/books for blind people
    -Outputs physical/3D form of data
(3 per type, max 3 types, max 9) [9]

2 (a) (i) Name: Text/String/alpha/alphanumeric
Description: Text/String/alpha/alphanumeric
Cost: Currency/integer/real/float
Whether: Boolean
Number: Integer
(1 for first three, 1 for last 2) [2]

(ii) Field Sizes: 10 – 50
                 50 – 250
                  4 –   8
                  1
                  1 –   4
Total   66 – 313 bytes (1)

(1) for showing that the field sizes should be added up
Multiply Total by 1000 (1) = 66000 to 313000 bytes
Add extra (10%) for overheads (1) = 72600 to 344300 bytes
Convert to sensible unit (÷1024) (1) = 70.9Kb to 344.3Kb.
(5 possible mark points, max 4) [4]

(b) Advantage:

-Processed/Searched more easily/quickly/Estimate of file size is easier

-e.g. When a customer wants to know the availability of an item the record can be found quickly/makes selection of storage easier

Disadvantage:

-The size of fields must be determined before use so space is often wasted/not sufficient

-e.g. The "description" field may not be large enough for a particular item.

(1 per -, max 4) [4]

3 -Working from home

-Fewer journeys/more free time/less supervision…

-Different types of jobs/jobs lost/job opportunities arising

-Production line/manual jobs being lost/replaced by more technical jobs

-Work done can be more visible to managers

-All work/times working can be seen/leading to rewards where appropriate/sanctions when poor effort

-Safety of workers is improved

-Computers/robots do dangerous tasks/can be used to accurately monitor dangerous processes

-Work time can be less rigid

-Work can be fitted in round other commitments/leads to simpler ways of job sharing

-The 24 hour job/office/commitment/world workforce

-Workers may always be contactable/throughout the world/communications.

(Up to 2 per group, max 3 groups, max 6) [6]

4 **(a)**

Line	X	A	OUTPUT	CONDITION
1	1			
3	1	1		
4	1	1	1,1	
5	2	1		
6	2	1		FALSE
3	2	4		
4	2	4	2,4	
5	3	4		
6	3	4		TRUE
7	3	4		

(1 for values of X and matching line numbers; 1 for values of A corresponding to values of X; 1 for giving correct outputs; 1 for giving 2 conditions) [4]

(b) **(i)** Change X = 3 to X = 11 [1]

(ii) -A first line to allow user to input value (N)

-UNTIL X = (N + 1) [2]

(c) e.g.

```
X = 5
REPEAT
   A = X * X
   OUTPUT X, A
   X = X + 5
UNTIL X = 25
END
```

Mark points:
-Begins with 5 (as first output)
-Loop with working condition
-Counter correctly incremented [3]

5 (a) (i) -Options appear on screen from which to select
-Selection may lead to submenus
-Menus arranged in a tree structure (from single root to many branches)
Use: In a passive information system e.g. Tourist guide at a train station.
(1 for use, + 2 other -, max 3) [3]

(ii) -Follows a spoken language allowing user to input queries in normal vocabulary/syntax
-Computer understands keywords/positions in sentence to get idea of syntax
-Will then search database for keyword to provide output or responses.
Use: e.g. On an expert system or search engine.
(1 for use, + 2 other -, max 3) [3]

(b) -Provides utility programs to allow user to carry out maintenance tasks (any 3)
-Provides security measures like passwords and identifications.
-Controls the hardware and the operations they allow.
-Provides translators to convert software into a form useable by the computer.
-Manages interrupts.
-To provide a platform for the execution of software
(1 per -, max 3) [3]

6 (a) (i) Data is transmitted along a single wire/one bit at a time. [1]

(ii) Data is transmitted along a number of wires/one byte (or more) at a time. [1]

(iii) Data can only be transmitted in a single direction. [1]

(iv) Data can be transmitted in both directions but only one at a time. [1]

(b) (i) -Each byte contains an even number of 1's
-A special bit is set to 0 or 1 to ensure that total is even.
-Byte is checked for even number of 1's after transmission.
(1 per -, max 2) [2]

(ii) -When two bits are in error the errors cancel each other out/10101001. [1]

7 -Data collected on site/by drilling /observation/explosions
-Data collected remotely/by satellite/by electronic means
-Collected data input to system via HCI/automatically
-Data input is compared to library of data to find matches…
-by inference engine…
-Using rules found in rule base
-Decisions made about geologic structure reported through HCI.
(1 per -, max 4)   [4]

8 (a) -Site map
        -a diagram showing the way the different screens fit together
        -shows the links between screens,
    -Gantt chart/progress chart
        -shows the different parts that need to be developed
        -shows which parts of the development are independent and which are reliant on each other.
    -Spider diagram
        -to show interaction between the different elements of the solution
        -and those parts which are independent of each other.
    -Flow diagram
        -to show the order of producing the parts of the solution
        -or to show the flow through the proposed site.
    (Up to 2 groups, up to 2 per group, max 4)   [4]

(b) -Documentation for owner of site
        -will be paper based
        -will contain instructions for changing/maintaining site
    -Documentation for viewer/visitor to site
        -will be on-screen
        -giving detailed help on searches/use of facilities/communication with site owner…   [4]

9 -Sound
        -Music to accompany the pictures/speech to explain the pictures….
    -Video/animation
        -Moving pictures to better describe the object on the site
    -Automatic hard copy/saving
        -Automatic downloading of data to printer/hard drive for future reference.
    -Hyperlinks
        -Allowing access to different sites/parts of site
    (Up to 2 groups, up to 2 per group, max 4)   [4]

10 Colour:
    -Contrast
    -Corporate schemes
    -Aggressive/passive/soothing colour schemes
    -Consistency over site to make site look cohesive
    -Use colour to provide emphasis
    -Accessability issues e.g. colour blindness

Layout:
-Consistent layout so user gets used to 'what is where'.
-Important things to top and left
-Data spread out across whole screen
-Tab order
-Group similar data together

Content:
-Limit to amount of content on a page
-Content on a page is cohesive
-Content matches the published intentions of the site
-Content is of sensible type and reading age for audience.
(1 per -, max 2 per group, max 6)   [6]

11 -The bit rate is a measure of the rate that data can be sent across the communication medium
    -Different communication media have different bit rates
    -For simple text/still pictures…a low bit rate connection is adequate
    -because volume of data per page is low and fixed
    -For (live) video/sound…bit rate needs to be high
    -because large volume of data which must be downloaded in real time because…
    -information is time sensitive.
    (1 per -, max 4)   [4]

12 (a) (i) -Custom written software is especially written/according to the requirements of the
            customer
           -Off the shelf is readily available/needs tailoring to the needs of the customer   [2]

    (ii) -no delay as it is ready immediately
         -No shortage of experienced users/ready trained/No learning curve
         -Software should be error free
         -Help available through Internet/colleagues/courses
         -Compatible with other users/software
         (1 per -, max 2)   [2]

   (b) (i) -Check data input to ensure it matches source data
           -Typed in twice…
           -by different people/at different times
           -inputs checked against each other for errors
           -manual check by comparing…
           -screen output of input with original document.
           (1 for first -, + any 2 other -, max 3)   [3]

    (ii) -Check data input is sensible/follows set rules/are reasonable
         -Data type/should be numeric
         -Data format/should be in currency form/xxx.xx
         -Length check/input should be < x characters
         -Presence check/something has been input.
         -Range check/value between 0 and some upper limit
         (1 for first -, + any 2 other -, max 3)   [3]