UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2007 question paper

9691 COMPUTING

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

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1 **(a)** **(i)** Consists of
- Windows
- Icons
- Menus
- Pointer

(1 per -, max 2) [2]

(ii)
- (Questions and) spaces for answers shown on screen/insertion boxes
- Input can be by radio buttons
- Pop up menus/drop down lists
- Insertion fields provided with validation checks
- Mirrors a hardcopy form

(1 per -, max 2) [2]

(b) **(i)**
- School/children/inexperienced users/home computer (almost any application)
- Ease of use

[2]

(ii)
- Any example where **on screen** input is necessary
- Allows for instructions/ensures no data is missed/ease of set up of validation routines

[2]

(c)
- Touch screen
- Ease of use/restrict vandalism/can be weatherproof/acts as input and output
- Menu based
- Restricts choices/tree design of choices

(1 per -, max 4) [4]

2 **(a)** 01010011
(1 per nibble) [2]

(b)
- Barcodes read as goods arrive/leave
- Number in stock is incremented if arriving
- Number in stock is decremented when leaving
- Software checks number in stock against reorder number…
- after every transaction
- When number in stock below reorder level then order created
- Note that order made is stored as Boolean 1 until order delivered
- Linked to supplier table for automatic ordering

(1 per -, max 5) [5]

3 **(a)**
- Data on ROM cannot be changed/on RAM it can
- ROM is not volatile/RAM is

(1 per -, max 1) [1]

(b)
- Operating system
- Those parts of application software in use
- User files

Note: All other suggestions should fit into one of the three acceptable answer groups. [3]

(c) (i) - Readily available when switched on/No need to ever alter software [1]

(ii) - Processor can only access data held in RAM
- Needs to be random access or access to data would be too slow [2]

4 **(a)** - Is solution technically possible?
- Is the solution economic to produce?
- Is the solution economic to run?
- What will be social implications of change?
- Is the skill level in the available workforce high enough?/training requirements
- What will be the effect on the customer?
- Will the introduction increase the profits?
- Time constraints

(1 per -, max 4) [4]

(b) - Information collection
  - Use of interview/questionnaire/document collection/observation/meetings
- Analysis of information collected
  - Produces clear view of present system
  - Diagrams to show how present system works
- Requirements specification
  - "Wish list" of requirements from user
  - Subjective list of requirements
  - Hardware and software requirements
- Consideration of alternative solutions
  - Matching of alternative solutions to needs of requirements specification
  - Justify one solution against others.

(1 per -, max 3 areas plus one expansion per area, max 6) [6]

5 - Loss of data can disrupt services to members of public
- Loss of data can be serious problem for company/organisation
- Taking regular back-ups of data
- Unauthorised access…
- may lead to wrong people learning personal information/misuse of data
- Use passwords/firewalls/… (to protect data from unauthorised access)
- Access rights
- To give confidence to people that their data is safe
- List those people who have access to it
- Data must not be passed on without consent
- Data can be inspected on request

(1 per -, max 6) [6]

6
```
WHILE DOOR NOT SHUT
        SHUT DOOR
END WHILE
IF HOT WASH  THEN  T = 80
             ELSE  T = 40
END IF
HEATER ON
REPEAT
UNTIL WATER TEMP = T
HEATER OFF
TURN M ON
FOR TIME = 1 TO 20 STEP 5
    IF WATERTEMP  < T
        THEN SUSPEND TIMER, REPEAT
            TURN HEATER ON
        UNTIL WATERTEMP = T, HEATER OFF
        RESTART TIMER
    ENDIF
NEXT TIME
TURN OFF M
SOUND BUZZER
```

Mark points:
*- Condition door is shut with action to shut door/loop to shut door
*- Condition hot or cool to set parameter
- Turn on heater H
- Loop until temperature met
- Turn M on
*- For loop with correct count…
*- and correct step
- Check for temperature in loop and correct action
*- Sound buzzer
(1 per *-, and any 2 other -, max 7) [7]

7 **(a)** - Knowledge base
- all the information about the particular study/about different formations and what they mean
- Rule base
- a set of definitions/algorithms to apply to the knowledge base/rules about interpreting the collected data
- Inference engine
- does the searching of the knowledge base using rules from the rule base
- Human Computer Interface
- to allow data/enquiries to be input and results to be output

(1 per -, max 3 pairs, max 6) [6]

(b) Set up:
- The knowledge of a number of experts is collected…
- and collated/edited
- Knowledge is stored in system
- Algorithms developed/to use rules collected from experts
- HCI developed (to suit users)

Used:
- System matches patterns/data from survey with
- patterns/data in knowledge base
- Uses rules (in rule base) to interpret (meanings of) patterns/data found
- Produces probabilities of successful drilling

(1 per -, max 3 per section, max 5) [5]

8 **(a)** - Computer/Processor on site
- Some form of data logging/collect data on storage over period of time
- Modem and phone line/satellite transmitter/mobile phone
- Modem/satellite receiver/computer at head office

(1 per -, max 3) [3]

(b) **(i)** - Hard copy output
- Larger scale printout
- Graphical output
- High level of accuracy

(1 per -, max 2) [2]

(ii) - Sound/beeper/emergency or urgent information/to draw attention to new radar data…
- (Hard copy) tabular/numeric/to study the data in detail/to search for anomaly in geology…
- On screen/graphical/to show snapshot of situation/to show result of one radar sweep/comparison of data

(2 per pair of points, max 2 points, max 4) [4]

9 (a) (i) - A copy of data being stored on the system
- stored away from the original
- taken at regular intervals
- includes the structure of the data
(1 per -, max 2) [2]

(ii) - A copy of some data being stored on the system
- for long term storage
- taken when data is no longer active
- not necessary to store structure, only data
(1 per -, max 2) [2]

(b) (i) - Expensive to collect the data
- (Do not want to repeat either in the event of) data corruption or data loss because…
- time consuming to re-process the data
(1 per -, max 2) [2]

(ii) - To compare with new material taken at a later date
- To reuse if other company wants survey of same area
- To reuse if circumstances change e.g. price of oil goes up making difficult area economically viable
- Allows data storage media to be freed up increasing the speed of processing
(1 per -, max 2) [2]

10 (a) - Data is numerical
- Allows for predictions to be made
- Formulae to be applied to the data/ease of calculation
- Tabular/graphical representation of data/for ease of understanding
(1 per -, max 3) [3]

(b) - Animation to maintain interest
- Use of video to show sites
- Sound to explain decisions
- Ability to present to a large audience all at once.
(1 per -, max 2) [2]

11 (a) (i) 10111100/the second one [1]

(ii) - This has an odd number of ones
- The others all have an even number of ones
- Even parity is being used
(1 per -, max 2) [2]

(iii) - There may be two (or an even number of) errors in one byte [1]

(b) - data bytes are added together

- MOD 256
- Result (Check Sum) is sent with data
- Calculation redone at receiving end
- Results compared
(1 per -,1st +conditional 3, max 4) [4]