UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2008 question paper

9691 COMPUTING

9691/01 Paper 1 (Written Paper 1), 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1 (a) (i) - To input data into the system

(ii) - To output results from the system

(iii) - To store data within the system when system switched off/for later use
(1 per -, max 3) [3]

(b) (i) - Temperature sensor/thermistor/keyboard
- To measure the water temperature/to enter parameters to system

(ii) - Heater/actuator/alarm
- To heat the water when below the required temperature/to allow the computer to control the heater/to warn when T wrong

(iii) - Hard drive/(any other reasonable)
- To store control program/data collected for later analysis
(1 per -, max 6) [6]

(c) (i) - Size/number of data items to be stored
- Name/identifier of array
- Data type of data stored in array
- Dimension of array
(1 per -, max 3) [3]

(ii) - X = the number of the piece of data in 24 hour period
- If X > size of array report error
- ARRAY_NAME(X) = Data Item
(1 per -, max 2) [2]

2 (a) - Comments/annotations/within the code/explaining the code/computer will ignore
- Sensible variable and module names/so that the reader does not have to resort to table in order to understand what they stand for
- Indentation/groups of program instructions/identified by some logical connection/start at different point on page from other instructions
- Modularity/code split into smaller groups/allow for local variables or allow for library routines
(Up to 2 per -, max 3 -, max 6) [6]

(b) (i) - Testing of logical paths...
- All routes through program code...
- To ensure that code follows the algorithm
- Use of desk checking
(1 per -, max 2) [2]

(ii) - Translator diagnostics/produced by translator program/when code transgresses rules
- Debugging tools/allow programmer to investigate conditions where error occurs
- Use of test data/to identify which inputs produce errors/Tracing of variable values
- Break points/Variable dump/to find values of all variables/at specific point in code
- Black box testing/to test functionality of code/expected results compared with actual results
- Cross reference/will report different modules/procedures/functions using the same variable names
(Up to 2 per -, max 2 -, max 4) [4]

3 **(a)** **(i)** - One off software/especially written to fit a specific application

(ii) - Software is appropriate to many areas/can be tailored to requirements

(b) - Custom written
- Machine is unique/product of machine unique/performs single task
- Generic software will not exist/will not be capable of tailoring
- Provision of extra facilities not required/will not allow software to run at maximum efficiency/should be in m.c. form

(1 per -, max 3) [3]

(c) - Creation of files necessary to run software/machine
- System testing
- Training of personnel
- Decision on changeover strategy/direct changeover

(1 per -, max 3) [3]

4 **(a)**

NUMBER	COUNT	MARK	OUTPUT
(4	1	40)	1, FAIL
4	(2	90)	2, MERIT
4	(3	60)	3, PASS
4	(4	50)	4, PASS

(1 per correct inputs, 1 per correct output. -2 if 5th line added) [8]

(b) E.g. IF MARK < 0 or MARK > 100 THEN REPORT ERROR
GO TO READ MARK
END IF

Mark points:
- Condition MARK < 0
- And condition MARK >100 (both conditions)
- Error report
- Loop back to read next MARK
- To be inserted into given algorithm after READ MARK

(1 per -, max 5) [5]

5 **(a)** - Workers are slow at inputting data
- Computer processes data very quickly
- Creating a speed mismatch
- Which would slow processor down
- Data is collected and processed only when worker is no longer involved
- Copy of data always on hard drive if need to query order

(1 per -, max 3) [3]

(b) - Daily
- Copy (copies) of the data file made to...
- Portable storage
- At least one copy kept off site
- Transaction files kept during day

(1 per -, max 4) [4]

(c) - (Large files) requiring deletion of old/infrequently used data
- This data stored on long term storage to free up space
- In case query about an order in the future
- For statistical purposes for management
(1 per -, max 2) [2]

6 **(a)** - Network cards/Wireless network cards
- Hub/Switch
- Cable/Radio aerials or connector
- Server (File/Network/Printer)
(1 per -, max 2)
- Network operating system
- Network versions of the software
(1 per -, max 1) [3]

(b) - Set of rules/instructions
- To govern data communication [2]

(c) - Sharing of software/files
- Sharing of hardware peripherals
- Workers may use any spare machine
- Values in databases are always up to date
- Easier for the technician to maintain
- Workers can communicate with each other
- Easier for the boss to see what is going on
- Data is less secure/private (Note: not 'hacked')
- Data requires locking when in use
- Viruses spread more rapidly
- If server/file server down then whole network affected
(1 per -, max 3 for advantages or disadvantages, max 5) [5]

7 **(a)** - Large quantity of data to be processed
- All of a similar type
- Data must all be connected before sensible processing can be done
- Does not need immediate processing
- Can be done at quiet time
- Payment is weekly giving set time for processing
- Does not need human intervention
(1 per -, max 4) [4]

(b) - Need to open a bank account/bank will charge
- May have difficulty accessing cash
- May not be confident that correct amount will be paid
- Workers prefer to be paid daily
- May be concerned that personal data may be hacked into
- May be concerned that their personal data could be passed on to others
(1 per -, max 4) [4]

8 **(i)** - Files/Software/Operating system
- Need to store large volumes of data/semi-permanently/access to data/ability contents easily

(ii) - Back up/Archive
- Need to be portable/to be rewritable

(iii) - Import software/keep original copies of software
- Cannot be changed (hence lost)/kept in case of need to reinstall [6]

9 **(a)** - E.g. Spellchecker
- Spellings are not changed [2]

(b) - E.g. Payroll file
- Is altered on a regular basis e.g. promotions [2]

10 N.B. Allow alternatives if well argued.

(i) - Form based
- To ensure that correct data is input/in the correct format/nothing missed [2]

(ii) - Command line
- To allow access to entire system/to access areas with minimum delay [2]

(iii) - Natural language
- Workers need no skill or knowledge/system will interpret their requests [2]