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

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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 [2]

(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 to alter 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]