

MARK SCHEME for the October 2008 question paper

<p>CAMBRIDGE INTERNATIONAL DIPLOMA IN COMPUTING 5216 Computer Systems, Communications and Software, Maximum mark 90</p>

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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.

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Page 2	Mark Scheme	Syllabus
	Cambridge International Diploma – October 2008	5216

- 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]

Page 3	Mark Scheme	Syllabus
	Cambridge International Diploma – October 2008	5216

- 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]

Page 4	Mark Scheme	Syllabus
	Cambridge International Diploma – October 2008	5216

- (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]

Page 5	Mark Scheme	Syllabus
	Cambridge International Diploma – October 2008	5216

- 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]