MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

7010 COMPUTER STUDIES

7010/31   Paper 3, maximum raw mark 60

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, which would have considered the acceptability of alternative answers.

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

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

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1   **(a)** One mark for identifying a tool, max two marks, one mark for a description:
- **Tool** – Gantt Chart
- **Description for Gantt** – e.g. show all stages/tasks to be done/show the critical path(s)/show key project milestones/progress of tasks as % completed/number of days to do a task

- **Tool** – PERT Chart
- **Description for PERT** – e.g. Program Evaluation and Review Technique/used for critical path analysis/used for complex problems with multiple tasks

- **Tool** – e.g. Project Management Software/Spreadsheet (allow 2 different types of software provided different valid reasons for use are given)
- **Description** – e.g. allows progress to be tracked/allows easy production and updating of Gantt/PERT charts   [4]

   (b) One mark per method, one mark for identifying how the method will be used for this case study, one mark for a further explanation.

questionnaires/survey
- produce series of questions to give to salesmen/filing clerks/customers
- can leave questionnaires with staff/in showroom for customers to complete etc

interviewing (not customers)
- ask salesman/filing clerk/showroom owner or manager a number of face to face questions
- allows questions to be tailored to the individual/ allows follow up questions to be asked etc.

document search
- gather information from existing customer invoices/bathroom fittings files/supplier order forms
- allows procedures to be studied first hand/ allows close scrutiny of all paperwork/files etc

Observation
- watch salesmen/filing clerk doing their day to day tasks
- gives first hand knowledge of how system works etc   [6]

   (c) One mark per device, one mark per reason for this case study.
Reason for choice must match device and be relevant for this case study.

- high resolution/large/good quality screen – spare part diagrams are very detailed
- large capacity hard disk – many files and diagrams require large storage capacity
- printer – print out customer invoices and/or supplier order forms
- pointing devices/touch screen – choice of menu options or selection of fitting diagram
- bar code reader/scanner – to identify fittings when sold/arrived   [4]

(d) One mark for every **two** correct symbols

    A   Process
    B   <u>Disk</u> storage
    C   Keyboard/manual entry
    D   Hard copy/document output
    E   Decision
    F   Input/Output
    G   Terminator/Start and End
    H   Connector   **[4]**

    0, 1 – no marks
    2, 3 – one mark
    4, 5 – two marks
    6, 7 – three marks
    8   – four marks.

(e) One mark for per process, max 3
   -   Fitting selection
   -   Update bathroom fitting stock file when a fitting is sold
   -   Update the daily takings
   -   Check reorder level
   -   Produce Orders for suppliers
   -   Total days takings

One mark per input, max 2
   -   Selection of fitting
   -   Barcode

One mark per data store, max 2
   -   Stock file
   -   Supplier file
   -   Bathroom fittings details file
   -   Takings file
   -   Database *(only if none of the above are given)*

One mark per output, max 3
   -   Diagrams of fittings (screen not paper)
   -   Supplier order (paper)
   -   Customer Invoices (paper)
   -   Daily takings totals   **[8]**

(f) Three marks for reasons only (MUST match up with choice)
No mark for choice.

existing software chosen for the following reasons e.g.:
- stock control software readily available
- already fully tested and de-bugged
- usually less expensive to buy
- technical support online/by phone
- usually compatible with other existing software

bespoke software chosen for the following reasons e.g.:
- can be tailored to meet the exact requirements of the bathroom fitting show room
- in contact with the actual programmers if there is a problem
- software can develop as it is used
- doesn't contain unwanted features   [3]

(g) One mark per point
Test data max 2
- use of test data sets
- normal test data has known outcomes
- extreme test data checks validation rules
- abnormal test data should produce error messages
- mention of normal, abnormal, and extreme data *(all 3 with no valid expansions, one mark if above not given)*

Types of testing max 2
- Black box
- White box
- System
- Alpha
- Beta
- User etc

Other
- testing that the stock control system meets the requirements for the showroom
- volume testing   [4]

(h) One mark per example must be appropriate to this system, one mark per reason must match example.
The following are examples only there are many correct answers.

- person's name e.g. John Smith
- this checks that system can accept appropriate inputs

- price of an item e.g. – $25
- checks that negative prices are rejected

- amount of stock arrived – e.g. 50
- checks that file updated correctly

- a <u>valid/invalid</u> barcode
- check that normal data is accepted/ invalid data is rejected   [6]

(i) One mark per item, one mark per reason must match item e.g.

program listing/coding
- so alterations can be made

programming language(s) used
- so the application can be recompiled

System flowchart
- overview of whole system

flowchart/algorithm/pseudocode
- so that the logic can be altered if required

input/output formats

hardware requirements
- for testing any alterations

software requirements
- for testing any alterations

known "bugs" in the system
- so they can be removed

list of variables used (and their meaning/description)
- so that alterations to code don't spawn new errors

file structures/data model
- so that files and file sizes can be checked

sample runs (with results and actual test data used)
- so that test can be re-run when alterations are made

validation rules
- so that any extra inputs can be subject to similar validation   [8]

(j) One mark for chosen method, max two marks for reasons given per choice, these must match the method and be appropriate to this system.
Arguments must relate to the case study

Direct changeover e.g.
- no need to run 2 systems side by side
- immediate benefits from new system
- less disruptive for sales/filing staff
- more likely to work since it will have been fully tested first

Parallel implementation e.g.
- good for training sales/filing staff since both systems can be compared
- if new system fails have old manual system as a back up

Phased implementation e.g.
- part of system (e.g. fittings/supplier/ database) introduced initially for trials
- if it is OK, gradually introduce other parts of the new system
- if a problem occurs, can stop using it any stage
- allows staff to gain confidence in its operation

Pilot implementation e.g.
- adopt new system at just one of the showrooms
- makes sure system fully works before adopting at another showroom
- can revert to old system as still in operation at other showrooms   [9]

(k) One mark for each point e.g.
points must relate to the case study

- discuss with salesman/filing clerk/manager/owner whether or not new system works
- discuss with salesman/filing clerk/manager/owner whether or not system was easy to use
- consider if objectives of new system have been met
- look at results from tests
- look at printouts etc. to see if system produced the correct outcomes   [4]