UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Diploma Advanced Level

MARK SCHEME for the October 2005 question paper

CAMBRIDGE INTERNATIONAL DIPLOMA IN COMPUTING

5216 Computer Systems, Communications and Software
Maximum mark 90

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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

CIE is publishing the mark schemes for the November 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses'.

1 (a) (i) word processor/database

(ii) spreadsheet/accounting

(iii) database/spreadsheet **[3]**

(b) (i) Backing up is making a copy of the entire data file...
- in case of corruption of working file.
- Short term
- Archiving is taking a copy of little used data
- for long term storage in case something needed again
- Redundant files can then be deleted in order to create space on medium.

(1 per –, max 4) **[4]**

(ii) – regularly
- copy of files
- to portable medium
- More than one copy made
- at least one copy kept off site
- Transaction log kept between back-ups

(1 per –, max 4) **[4]**

(c) (i) OS/data files/software

(ii) Back up/archive

(iii) Import of new software. **[3]**

2 (a) (i) Data is collected before processing together

(ii) Data is processed immediately/within an acceptable time frame

(iii) User is able to communicate with processor directly

(iv) User is not connected to processor. **[4]**

(b) – Batch
- Offline
- Sets of daily hours must be collected for each worker.
- Faster to process if processor not bothered by user/all data collected/no need for user input. **[4]**

3 (i) – Screen mirrors a data capture form/is a data capture form
- Spaces for answers to questions
- Drop down lists providing limited choices for some questions
- Important questions must have input before carrying on
- Validation is made simpler because of limited choices
- Used in telephone sales or equivalent example **[3]**

(ii) – Series of options from which...
- user chooses...
- possibly leading to submenu
- Limits user
- Used typically with touchscreen
- information bureaus or equivalent example. **[3]**

(iii) – Prompt on screen
– User types commands
– Must ensure syntax correct
– Must learn commands
– Allows access to whole system
– Technician looking after a network/or equivalent example. **[3]**
(3x1 per –, max 2 per dotty +1 per dotty for use, max 9)

4 **(a)** – Translator diagnostics
– when the source code is translated the translator will spot syntax errors
– Desk checking
– following the logic of the code manually
– Debugging tools
– range of tools to study characteristics when the code fails
– Bottom up programming
– code is in small modules making it easy to check
– (Black box) testing
– choosing test data to study the results produced/set results against expectations
– Trace tables
– trace the values of variables through a program run
– Variable dump
– see values of all variables at a particular place in the code
– Break points
– to stop execution at significant points
(2 per type, max 3 types, max 6) **[6]**

(b) – Comments/annotations in code
– code which machine ignores/explains rest of code
– Modular structure
– so that only small amounts of code are to be understood at a time
– Meaningful names
– which explain meaning of variable/function/procedure
– Indentation
– to show which lines of code are conjoined
(2 x 2 points, max 4) **[4]**

5 **(a)** – Data sent as binary bytes
– bytes added up
– with no carry out of byte
– before transmission
– result is transmitted
– Added again after transmission
– two values are compared.
(1 per –, max 3) **[3]**

(b) **(i)** – Message split into equal sized packets
– each packet labeled
– each packet numbered
– Each packet travels independently
– At each node label checked and packet redirected.
– Must be reassembled in correct order at destination.
(1 per –, max 3) **[3]**

(ii) A: – less chance of message being intercepted
– if a route is congested/blocked an alternative route is used.
D: – Travels at speed of slowest packet
– Must be reordered at destination.
(1 for advantage and 1 for disadvantage, max 2) **[2]**

6 **(i)** – To coordinate the work of the rest of the processor **[2]**
– manage the execution of instructions
– choreograph the instruction cycle by using a clock

(ii) – Store OS
– Store application software in use **[2]**
– Store data files in use

(iii) – Carry out processing/calculations
– Carry out I/O from processor
– To make logical decisions **[2]**
– To manage the flags
(1 per –, max 2 per dotty, max 6)

7 **(a)** – Types of data
– Sources of data.
– form data stored in
– amount/type of data storage required
– Data structures to be used
– Relative importance of different types of data
– Access methods
– Is data to be static or regularly altered
(1 per –, max 4) **[4]**

(b) – Cost/limit to the budget that can be used
– Time/software must be ready by a particular date
– Site/is site dirty, small,…
– Workforce/Are they trained, is there a large pool to draw from…
– Availability/do the hardware and software exist, can they be produced easily
(2 per pair, max 4) **[4]**

8
– Loss of jobs
– More jobs available in some areas
– tend to be technical jobs
– training required
– some, probably older, workers unable to retrain
– Training leads to extra qualifications...
– extra responsibilities...
– more highly paid jobs
– Less danger to human beings on production line.
– problems with computers and health.

(1 per –, max 5) **[5]**

9
– Sound
– set alarm for immediate response
– On screen
– to provide visual representation of the process to identify where the problem is
– Hard copy text
– to provide evidence for later study
– Graphical
– to indicate (quickly) whether still within parameters
– Tabular
– to provide exact figures which can be compared with adjacent readings
– Analogue/digital meters
– to provide readings
– Lights
– to indicate state of the process

(2 per pair, max 6) **[6]**

10 **(a)**
– Who will be using it
– What information needs to be conveyed
– Under what circumstances must it operate
– How effective will it be in conveying the information

(1 per –, max 2) **[2]**

(b)
– Colours to be used/do not use red and green
– Contrast/ensure background and text are suitably contrasting
– Size/of fonts, diagrams,...
– Layout/left to right and top to bottom (accept other)
– Volume/not too much on single page
– Highlighting/use sparingly, video reverse, flashing,...
– Navigation/to move between screens

(2 per pair, max 4) **[4]**

11 (a) – Automatically calculates costs/stresses/...
– Works out volumes of material needed
– Ensures design remains between previously set parameters
– Can simulate finished product
– Allows for changes to be easily made
– Can then be passed to manufacture seamlessly.
(1 per –, max 4) **[4]**

(b) – Generic packages designed to satisfy needs of a number of applications
– This is specialised...
– one off application
– May contain standard modules...
– but must be designed for one production line
– Different product/machines than any other production line.
(1 per –, max 2) **[2]**

12 (i) – Decisions/reports/responses triggered by meeting some parameter
– e.g. Number of a component falls below minimum level/...

(ii) – Provides information upon which decisions may be based
– One type of product takes longer to produce than another/... **[4]**

Total [90]