CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2012 series

9713 APPLIED ICT

9713/13 Paper 1 (Written A), maximum raw mark 80

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

CAMBRIDGE
International Examinations

1 (a) *Batch process control*
Two from:
Used in food mixing process
Amounts of raw materials are combined together
Mixed for a certain length of time
Amount of each ingredient is controlled by computer
Length of time for each stage controlled by computer
Temperature controlled by computer **[2]**

Continuous process control
Two from:
Used in storing process
Used in processes which appear to be unending
Temperature has to be maintained continuously **[2]**

Discrete process control
Two from:
Used in Food packing process
Like an on/off or stop/start process
The computer control involved in putting mixture into cartons is discrete
A carton is packed, the next carton comes along, the robot packs it exactly the same **[2]**

(b) **Six** from:
Receives data from sensors
PLC is a type of computer/microprocessor used for a single purpose
Has analogue and digital inputs
PLC stores preset value of temperature
Logic statements are used to compare the temperature with a pre-set value
It switches the compressor on or off depending on the results of the comparison
Rarely any input to it from the user once it has been programmed
It is used in this process as the pre-set value is constant
PID…
…calculates the difference between the input value and the pre-set value
It causes the PLC to make proportional changes to the temperature…
…by switching the compressor on for short periods of time
If the temperature is higher than the required temperature it calculates the difference
PLC switches compressor on for a short time and checks the difference again
If there is still a difference, PLC switches the compressor on very briefly
This is repeated until the required temperature is reached **[6]**

2 (a) **Two** from:
Wages so far this year
Income tax so far this year
Employer insurance contribution so far this year
Employee insurance contribution so far this year
Pay date
Pension contributions so far this year **[2]**

(b) **Three** from:
Name
Contact details i.e. phone/address
Holiday entitlement
Rate of pay
Tax code
Job title
Employee number/id number/payroll number/works number
Social security/national insurance number
Department worked in
Date employed
Bank details
Payment method
Date of birth **[3]**

(c) **Three** from:
Deletion of a record such as a worker leaving employment
Change/amendment to a record such as a worker changing address/job title/phone
Addition of a record such as when a new employee starts with the company **[3]**

3 **(a)** **Two** from:
Can keep a closer watch on work progress
Employees will tend to be on task – not distracted by home entertainment
Data is more secure as it doesn't leave the office
Don't have to subsidise home workers equipment
Easier to arrange team meetings/make contact with all employees (about any changes to task requirements) **[2]**

(b) **Four** from:
Have greater personal contact with colleagues
Can discuss ideas with colleagues
Can see the manager daily...
…have greater chance to impress manager giving better job prospects
Home based telework is inappropriate for some people
Many homes are not well equipped for home working
Easier to concentrate on work as there are fewer distractions **[4]**

4 *Systems* - **Three** from:
A detailed overview of the whole system
What is expected of the system/purpose of the system
Data Flow Diagrams/systems flowcharts
The results of systems analysis
What is expected of the system/purpose of the system
Test plan and test results
Overall design decisions…
…the choice of hardware and software
…file, input and output structures
Systems flowcharts

Program - **Three** from:
Description of the software/purpose of the software
What the software does and its features
Program listing
A complete copy of the code used
Annotation explaining what each module of code does
Reasons for choosing those pieces of existing software that were used instead of the programmer having to write code
Input and output data formats
Program flowcharts/algorithms
Program listing – a complete copy of the code used
Annotation explaining what each module of code does
Notes that will help any future programmer to make modifications to the system **[6]**

5 **(a)** **Four** from:
Reporter types up/edits their story using word-processing software/DTP
Reporter types up/edits their story using laptop
Takes photographs using a digital camera/phone
Import images from digital camera/phone
Edit images using picture editing software
Connect laptop to Internet using mobile phone/WiFi hotspot/dongle
Email story to editor's office
Email photos separately using phone/laptop **[4]**

(b) **Two** from
Page in digital form/fax form
is sent up to a satellite
Transmitted by the satellite to the various printing plants simultaneously

or

Two from:
The image of the printed page is burned onto light-sensitive film
The film of the page is placed in a large fax machine
The image faxed to the print plant **[2]**

6 **(a)** **Four** from:
An easy-to-remember domain name
A secure method of accepting payments
Descriptions/pricing/photos of goods
Usernames and passwords to make the system secure
Customers are able to contact shop directly via e-mail
Allows customers to make use of their orders stored in a database
Allows customers to see their order and maintain their own accounts
A shopping basket to hold goods you are going to buy
Prospective customers should be able to use a temporary shopping basket
Returning customers can have a permanent shopping basket
Searches and advanced searches can be carried out easily
Customers can move easily to the checkout/navigate from category to category easily
Orders can be tracked
Wish lists which enable users to store the goods they might want to buy in the future
'People who bought A also bought B' recommendations **[4]**

(b) **Four** from:
Increased unemployment for checkout operators/sales people
Increased unemployment for security staff
Increased unemployment for staff who organise stock control
Increased employment for technical staff/programmers
Increased employment for van drivers
Increased employment for call centre operators **[4]**

7 **(a)** **Five** from:
Consists of a number of separate tables
For example a sales records table and a customer records table
Tables are linked to each other…
…using a primary/key field
Key field could be the customer ID
Key field is part of the other table(s)
Data from one table combined with data from other table(s) when producing reports
Can select different fields from each table for output
SQL is used for queries and producing reports **[5]**

Three from:
data is not repeated…
…so less storage capacity needed
If data was duplicated hackers would have easier access to data
Easier to expand the database
Data only needs to be amended once
Easier to produce reports **with cross-tabular data rather than separate files** **[3]**

8 **(a)** **Three** matched pairs from:

Range check on credit limit
Credit limit for new customers <= $2000 and >= $500

Type/character check on credit card number
Only digits are accepted

Length check on credit card number
No more than or less than 16 characters

Check digit on credit card number
Extra digit calculated from digits in credit card number and appended to number

Length check on Customer ID
No more than or less than 7 characters

Picture/format check on Customer ID
Must be one letter followed by 6 digits **[6]**

(b) Use of normal/live data such as a number between 500 and 2000
This data should be accepted by the system
If it isn't the validation rule needs to be amended to ensure the acceptable value is >=500 and <=2000 **[3]**

Use of abnormal data such as 2001 or "two thousand"
This data should be rejected by the system
Amend rule to ensure that it uses 500 to 2000/amend rule to ensure it checks it is numeric/amend rule to make sure < hasn't been used instead of > and vice versa **[3]**

Use extreme data such as 500 or 2000
This data should be accepted by the system
If it isn't amend rule so it is <= and not just < / check it is >= not just > **[3]**

9 Service advertising **[1]**
Two from:
Advertising of services rather than goods
Used in insurance, government, tourism, banking, education
College courses constitute education **[2]**

10 **Four** matched pairs from:

Scores can be plotted in graphs
Used to chart progress/results of students can be compared/results of classes can be compared

Grades/percentages can be calculated from raw scores
Difference between target grades and actual performance can be calculated/number of students achieving a particular grade can be calculated

Averages can be calculated (for each student)
Individual scores can be compared to class/year average

Scores can be searched/sorted
To list best/worst performing students/students achieving a particular mark range/grade so that these students can be set suitable targets

Statistics can be calculated/maximum/minimum mark can be found
The highest/lowest mark can be used to identify best/worst performing student **[8]**