

## **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.

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- 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]

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**(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

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*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

Username 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]

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- (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  $\leq \$2000$  and  $\geq \$500$
  
  - 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]**

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(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  $\geq 500$  and  $\leq 2000$  [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  $\leq$  and not just  $<$  / check it is  $\geq$  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]