

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
GCE Advanced Subsidiary Level and GCE Advanced Level

## **MARK SCHEME for the May/June 2014 series**

# **9713 APPLIED TECHNOLOGY AND COMMUNICATION TECHNOLOGY**

**9713/12**

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 May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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1 (a)

Number of passengers	
A bar code number	✓
A flight number (consisting of two letters followed by three digits)	
Name of destination	

[1]

(b)

Number of passengers	
A bar code number	
A flight number (consisting of two letters followed by three digits)	✓
Name of destination	

[1]

(c)

Number of passengers	✓
A bar code number	
A flight number (consisting of two letters followed by three digits)	
Name of destination	

[1]

2

Live data is test data that has never been used before	
Abnormal data would be 500 passengers on a flight with 300 seats	✓
Live data is test data for which the results are already known	✓
Extreme data would be 300 passengers on a flight with 300 seats	✓
Extreme data is data of the wrong data type for the field concerned	
Normal data is data that is within a given range	✓
Abnormal data is data of the correct type for the field concerned	
All data that is not abnormal is extreme	
Testing will not indicate where improvements can be made	
Modules are never adjusted as a result of testing	

[4]

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**3 (a) Three** from:

- Using test results to evaluate the solution
- Obtaining feedback from the user
- (using the results of user feedback/test results) to identify limitations
- Using knowledge of the limitations to make improvements
- Discussing with managers whether new system has met original objectives

**[3]**

**(b) Systems documentation – one** mark

**Two** from:

- The results of the systems analysis/dfd diagrams
- What is expected of the system/purpose of the system
- Overall design decisions such as the choice of hardware and software
- Overall design decisions such as file, input and output structures
- Test data/test plans so that systems analyst can see the results of these/test results
- Systems flowcharts

Program documentation – **one** mark

**Two** from:

- Description of the software/purpose of the software
- Reasons for choosing those pieces of existing software that were used instead of the programmer having to write code
- Input/output data formats
- Program flowcharts/algorithm
- Program listing – a complete copy of the code used with annotation explaining what each module of code does
- Notes that will help any future programmer to make modifications to the system

**[6]**

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**4 (a) Three from:**

Tick boxes which would be suitable for OMR  
Strike throughs/lozenges would be suitable for OMR  
Multi choice options would be suitable for OMR  
Individual character boxes more suitable for OCR

**[3]**

**(b) Five from:**

Doesn't matter whether the handwriting is poor with OMR  
OMR would need more detailed instructions for the passenger  
OMR does not allow extended answers  
OMR reading is a more accurate process/fewer mistakes  
OCR can be used to read text anywhere/does not rely on reading forms  
OMR is a faster method of input  
OMR forms are easier to complete than OCR

Must have at least one each from OMR and OCR to gain full marks  
One mark is available for a reasoned conclusion

**[5]**

**5 (a) Phishing**

**Two** from:

E-mail appear to be from customer's bank  
Ask for customer's details – password, card/account number, other security details  
E-mail makes up plausible reason  
Can include a link/website address for customer to go to which looks just like the actual bank's website but is a fake website

*Pharming*

**Two** from:

Installs a piece of malicious software/code on customer's computer  
Fraudster redirects genuine website's traffic to own website  
Customer is now sending personal details to fraudster's website

*Spyware*

**Two** from:

Downloaded/software used to gather user's key presses  
Software detects key presses of user logging on to bank site

**[6]**

**(b) Three from:**

Expense of buying a computer with a broadband internet connection  
Unable to make cash deposits or withdraw cash without physically going to the bank or to an ATM  
May not like it that the bank is not providing the 'personal touch'  
May mismanage accounts as it is so easy to transfer money from one account to another

**[3]**

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(c) **Three** from:

Save costs as don't have to rent so many high street premises  
Employ fewer staff therefore less paid in staff wages  
Save costs of printing/sending statements  
Lower running costs, fewer branches so less electricity, heating and lighting  
Because of lower costs can offer higher rates of interest for savers and lower rates of interest for borrowers...  
...these rates attract more customers  
Less likelihood of the bank being robbed  
Less money is spent as there are fewer security staff

[3]

6 (a) *Anonymised information:*

Information about individuals without mentioning the person by name

[1]

*Aggregated information:*

Personal details of individuals are combined to provide information without naming those individuals

[1]

(b) **Two** from

Can identify the number of customers from a specific area  
Can identify the number of customers who have overdrafts  
Can identify the number of customers who have deposits greater than a certain sum

[2]

(c) **Five** from:

Information must be kept secure  
Must abide by data protection rules  
Employees must not share any customer data with anybody outside the organisation  
Employees should sign a confidentiality agreement/have a duty of confidence  
Employees should have a duty of fidelity  
Information about an individual should not be passed from one organisation to another without permission of the individual

[5]

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**7 Three from:**

Some workers may have to/will have the opportunity to go part time  
 There will be the opportunity to job share  
 There will be the opportunity for flexible working hours  
 There will be the opportunity to work compressed hours  
 Workers will need to have the ability to move from branch to branch

**[3]**

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

Conditional formatting  
 Cells are coloured differently to indicate acceptable progress or otherwise

Graphs/charts  
Comparison of student's chart with target grades/class average/previous scores/gradient of the graph shows whether there is improvement or not

Calculate average score of student  
Comparison of student's score with average/comparison of student's score with target grades

Maximum function  
 Could see which was highest mark and when

Minimum function  
 Could see which was lowest mark and when

Sorting/filtering  
 To produce a rank order of students + reason – for the purpose of grading/setting/to list best/worst performing students/students achieving a particular mark range/grade so that these students can be set suitable targets

Goal seek  
 Could see what test results required to achieve satisfactory average

**[8]**

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**(b) Three** from:

- Results will be calculated more quickly/graphs produced more quickly
- Results will be displayed more neatly
- Results will be calculated more accurately
- Validation can be incorporated
- Results can be exported directly into a report/document
- Easier to manipulate data
- Easier to edit data/errors
- Focus on specific areas more easily

**[3]**

**(c) Three** from:

- Import/insert data from spreadsheet
- Copy and paste chart from spreadsheet
- Link to data/spreadsheet
- Mailmerge to insert grades/marks/name of student

**[3]**

**(d) Two** from:

- Inkjet unsuitable for bulk printing
- Don't have to keep changing cartridges like an inkjet
- Faster to print multiple copies than inkjet or dot matrix
- Dot matrix quality is not good enough

**[2]**

**9 (a) Three** from:

- Don't have to spend so much on utilities
- Increased productivity due to more content workforce/improved motivation
- More likely to retain staff so don't have to spend money on retraining
- Lower costs as can rent smaller/fewer offices
- Don't have to pay travelling expenses for conferences
- Less need for land for car parking space so some land could be sold off

**[3]**

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**(b) Three** from:

Time is not wasted travelling/ more free time because of less travelling  
 Can spend more time with their family/can arrange their work schedule to suit themselves  
 Don't have to live close to the company so can live in area of their choice  
 Don't have to spend money on fuel/transport travelling to work  
 Don't have the stress of travelling to work in rush hour  
 If the payroll worker is disabled it's easier for him/her as he/she doesn't have to travel [3]

**10 (a)** With no thought given to the order/data has not been sorted/stored in the order they are added [1]

**(b) Three** from:

Data is collected together in a transaction file  
 In the course of the week  
 It is processed in one go with the master file  
 To produce payslips (usually overnight)  
 Without human intervention [3]

**11 Six** from:

The transaction file is sorted in the same order as the master file  
 Sorted on employee number  
 First record in the transaction file read  
 Reads first record in the old master file  
 These two records are compared  
 If records don't match computer writes master file record to new master file  
 If it matches transaction is carried out

*Then*

*If transaction relates to calculation of pay:*

Computer calculates the pay  
 Using rate of pay from master file  
 Using hours worked from transaction file  
 Computer calculates the income tax/insurance/pension contributions  
 Computer subtracts this from total pay  
 Processed record is written to master file  
 Process is repeated until end of old master file

*If transaction relates to deletion, amendment or insertion:*

If deletion or amendment old master file record not written to file  
 If amendment/insertion data in transaction file written to master file  
 Process is repeated until end of old master file  
 Remaining records of the transaction file are added to the master file [6]