MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers

9713 APPLIED INFORMATION 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 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 October/November 2011 question papers for most
IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level
syllabuses.
1 (a) **Four** descriptions and **four** advantages from:

- **Use** – satellite navigation system/GPS to find her way to the stores
  **Advantage** – more up to date maps/easier to locate route/can find alternative route avoiding traffic jams/don’t have to stop or get distracted by trying to use a map as GPS has audio capability/more robust than an atlas

- **Use** – a laptop/PDA/handheld computer to store her appointments
  **Advantage** – quicker/easier to search for information/can set meeting alerts

- **Use** – a laptop/PDA/handheld computer/mobile phone for storing phone numbers.
  **Advantage** – quicker/easier to search for information

- **Use** – mobile phone to contact the store she is visiting (when in traffic jams)/contact office
  **Advantage** – can be used wherever you are

- **Use** – an MP3 player to listen to her music/for entertainment
  **Advantage** – more portable than a CD player/a number of CDs/stores more tracks

- **Use** – a laptop to type up reports
  **Advantage** – easier to edit/format text

- **Use** – Laptop + internet connection to email reports
  **Advantage** – report is with head office/manager more quickly

- **Use** – Digital camera to take photos to include in report
  **Advantage** – can upload images directly/quickly into report

2 Maximum of two ways with two marks awarded for each way thus –

**Two** from:
- graphs/charts can be produced
- comparison of student’s chart with target grades
- comparison of student’s chart with class average
- comparison of student’s chart with previous scores
- gradient of the graph shows whether there is improvement or not

**Two** from:
- conditional formatting is used:
  - to colour cells red for below average progress
  - to colour cells orange for average
  - to colour cells green for above average progress

**Two** from:
- separate sheets to store scores for different classes/groups
- graphs/charts produced to compare progress of different groups/classes

**Two** from:
- calculate average score of student
- comparison of student’s score with average
- comparison of student’s score with target grades
3  (a)  Four from:

Examples of how to use the system e.g. (screenshots/video tutorial of how to) print/load/save/install etc.
The purpose of the system
The input and output formats
The hardware and software needed to run the system
Examples of sample runs of the system
What to do when errors occur/meaning of error messages
Troubleshooting (guide)/frequently asked questions  [4]

(b)  Two from:

Saves computer company time in the long run as they will not be contacted on a regular basis
Saves computer company time in the long run as they will not need to visit users to show them how to use the system
Save money as they won’t need to employ as many customer support staff  [2]

4  (a)  Condensing unit  [1]

One from:
Allows refrigerant to cool/cools gas to form liquid
Is situated at rear of refrigerator  [1]

Evaporation unit  [1]

One from:
Absorbs heat from surrounds thereby cooling it
Is situated inside refrigerator  [1]

(b)  Two from:

Sensor to monitor temperature inside refrigerator
Contact switch/pressure sensor to check if the door is closed
Number pad/touch pad/touch screen to input required temperature
LED display/screen to indicate current temperature inside the refrigerator
Actuator to activate buzzer/Buzzer if door is left open
Actuator to activate compressor
Actuator to activate valve  [2]
(c) **Four** from:
- required temperature is input/set
- microprocessor reads temperature from sensor
- Data from the sensor converted to digital/using an ADC
- temperature of refrigerator/value read by sensor/current temperature is compared to pre-set value
  - if greater than preset value microprocessor activates/sends a signal to actuator
  - if greater than preset value microprocessor/actuator switches compressor on
  - if greater than preset value microprocessor/actuator opens valve
  - if it is below the preset value microprocessor activates/sends a signal to actuator
  - if below the preset value actuator/microprocessor switches compressor off
  - if below the preset value actuator/microprocessor switches valve off
- microprocessor sends data to LEDs indicating the current refrigerator temperature
- microprocessor compares data from pressure sensor with zero/checks contact switch
  - if it is zero/contact broken microprocessor sends a signal to the actuator
  - if it is zero/contact broken actuator/microprocessor switches the buzzer on

5 (a) **Data flow diagrams**

**One** from:
- Uses terminators, processes, flow arrows and stores
- Represents inputs, outputs and processing

**System flowcharts**

**One** from:
- Uses particular input, output, storage and processing symbols
- Represents inputs, outputs and processing (only if not used for DFDs)

(b) **Five** from:

Helps identify problems with the current system
- Detail of the diagrams will reveal any weaknesses in the current system.
- easier to see where there is job duplication
- helps identify suitable hardware/software (for a new system)
- establishing inputs, outputs and processing requirements
- identifies storage requirements
- helps identify volume of data.
- helps identify the user/information requirements
- can see exactly what job each worker is doing

6 (a) **Five** from:

Consists of a number of (separate) tables
- For example, a customer records table and a sales table
- Tables are linked to each other
  - using a primary/key field
- For example, the customer number
  - this field is part of other table(s)
- Data from one table can be 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
- Relationships can be one to one, one to many, many to one, many to many

© University of Cambridge International Examinations 2011
(b) Three from:
   Data is not repeated
   less storage capacity needed
   If data was duplicated hackers would have easier access to data
   Easier to expand
   Data only needs to be amended once
   Easier to produce reports with cross-tabular data rather than separate files

(c) Four from, Customer data must be:
   Kept secure
   fairly and lawfully processed
   processed for limited purposes
   adequate/relevant/not excessive
   accurate and up to date
   not kept longer than necessary
   processed in accordance with the individual’s rights/not passed to third parties without their permission.
   not transferred to countries outside that country unless it has adequate protection for the
   individual interests of the individual or another person

7 (a) Five from:

   Web authoring package to create web site
   Word-processing package for typing text/tables etc.
   DTP for creating pages for website
   Spreadsheet to create statistical tables/graphs for inclusion in the website
   Communications software to connect to Internet
   Web browser to see how the web site appears to users
   Graphics software/image editing software for editing/creating images
   Animation software to edit/create animations for inclusion in the website
   Video editing software to edit videos for inclusion in the website
   Sound editing software to edit sound for inclusion in the website
   Presentation software to create slideshows

(b) Four from:

   type in/enter website(address)/select shop website from favourites
   Browse product categories
   browse products
   place selected products in shopping basket
   go to the/click on checkout.
   enter/log on using username and password
   enter billing address
   enter shipping address
   customers who are not previously registered must type in personal details
   choose method of payment.
   Enter bank/credit card account details
   choose method/speed of delivery
   confirm order
   Click on log off
(c) **Three** from:

- Items are usually cheaper as staff costs are lower/rental/running costs are lower
- Customers can spend time comparing products and prices without being rushed
can shop at time of their own choice
don't have to spend time queuing-going around different shops/travelling to shop/can avoid
traffic congestion
disabled people don't have to leave house
can look at wide range of shops all around the world/can use price comparison websites
No travelling expenses/don’t waste fuel
Don’t feel embarrassed showing certain products to a cashier/lacks confidence talking to a cashier

(d) **Three** from:

- Security concerns about data transmitted over internet such as hacking, phishing, pharming,
  spyware, viruses, malware
  description of phishing
  description of pharming
  can order goods and they don't get delivered
goods are not to the same standard as those ordered/can’t check the standard of goods
  before buying
  may be hidden costs such as delivery charges
description of viruses
Expense of buying a computer with a broadband internet connection

8 (a) **Two** from:

- Phone operators will be paid less
- Buildings needed to house call centres will be cheaper to buy/rent
- Call centre opening during normal hours in some countries would be unsociable hours in UK
  leading to a lower wage bill.
The operators would be better qualified
The operators would be more motivated

(b) **Two** from:

- The operator might not understand UK dialects
- The customer might not understand operator’s accent
- Operators might have difficulty with UK culture
- Operators may be inclined to stick to script/may be unable to answer out of the ordinary
  questions
(c) Two matched pairs from:

Too many plugs connected to a socket/overheating of computers can be a fire hazard
Make sure there are enough sockets in the room/don’t overload sockets/CO$_2$ fire extinguisher/use LCD monitors/have adequate ventilation/don’t place computers too close together/make sure ventilation holes are not blocked

Bare wires/spilt drinks can cause electrocution
Don’t allow food and drink inside room/ensure all wires are fully insulated

Trailing cables can cause tripping
Ensure adequate trunking is in place/place cables under carpet/use WiFi devices

Heavy equipment may fall and injure somebody
Ensure desks or tables are large enough and sturdy [4]

9 (a) Part time working – working a limited number of hours/working less than the normal working hours of a full time employee [1]

Flexible working hours – workers choose the time of day they want to work (but work the same number of hours every week) [1]

Job sharing – two (or more) workers doing the job of one worker (working full time) [1]

Compressed hours – working for same number of hours as a normal working week but over fewer days [1]

(b) Four from:

Part time working/job sharing
Helps to retain and attract staff
When fully trained staff are retained no need to train new workers
Stores open in the evening so part time staff can be used for unsociable hours
Workers can be fresher and more creative
Can use a number of employees at busier times/fewer at quieter times

Flexible working hours/Compressed hours
Shops can be open for longer periods
Allowing for individual workers’ needs improves absenteeism/punctuality
Appeals to employees so helps recruitment and retention of staff
Employers can match employees’ working hours with busy and not so busy times

Job sharing
Employer gets two sets of skills for the cost of employing one worker [4]