UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Advanced Subsidiary Level and GCE Advanced Level

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.

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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   [8]

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   [4]

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   [4]

5 (a) Data flow diagrams   [1]

One from:
Uses terminators, processes, flow arrows and stores
Represents inputs, outputs and processing   [1]

System flowcharts   [1]

One from:
Uses particular input, output, storage and processing symbols
Represents inputs, outputs and processing (only if not used for DFDs)   [1]

(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   [5]

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   [5]

(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 [3]

(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 [4]

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 [5]

(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 [4]

(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 [3]

(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 [3]

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 [2]

(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 [2]

(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]