

**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.

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|               |   |                 |              |
|---------------|---|-----------------|--------------|
| <b>Page 2</b> | <b>Mark Scheme: Teachers' version</b>         | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>GCE AS/A LEVEL – October/November 2011</b> | <b>9713</b>     | <b>12</b>    |

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]

|               |   |                 |              |
|---------------|---|-----------------|--------------|
| <b>Page 3</b> | <b>Mark Scheme: Teachers' version</b>         | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>GCE AS/A LEVEL – October/November 2011</b> | <b>9713</b>     | <b>12</b>    |

**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: [1]
- Allows refrigerant to cool/cool gas to form liquid
- Is situated at rear of refrigerator [1]

Evaporation unit [1]

- One from: [1]
- 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]

|               |   |                 |              |
|---------------|---|-----------------|--------------|
| <b>Page 4</b> | <b>Mark Scheme: Teachers' version</b>         | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>GCE AS/A LEVEL – October/November 2011</b> | <b>9713</b>     | <b>12</b>    |

- (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>Page 5</b> | <b>Mark Scheme: Teachers' version</b>         | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>GCE AS/A LEVEL – October/November 2011</b> | <b>9713</b>     | <b>12</b>    |

**(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]

|               |   |                 |              |
|---------------|---|-----------------|--------------|
| <b>Page 6</b> | <b>Mark Scheme: Teachers' version</b>         | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>GCE AS/A LEVEL – October/November 2011</b> | <b>9713</b>     | <b>12</b>    |

**(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]

|        |  |          |       |
|--------|--|----------|-------|
| Page 7 | Mark Scheme: Teachers' version         | Syllabus | Paper |
|        | GCE AS/A LEVEL – October/November 2011 | 9713     | 12    |

(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<sub>2</sub> 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]