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.
1 A Pen drive (1)  B Chip reader (1)  
C Remote control (1)  D Graphics tablet (1)  [4]

2 CD RW  hard disc  hub
PIN  plotter  switch  [2]

3

<table>
<thead>
<tr>
<th></th>
<th>User</th>
<th>Technical</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>frequently asked questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>program coding</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>system flowcharts</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>trouble-shooting guide</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 (a) The **most suitable** storage medium for storing data on a network server is a magnetic hard disc [1]

(b) lists of illnesses and their symptoms are stored in a knowledge base [1]

(c) An optical disc which cannot have data updated is a CD ROM [1]

(d) Photos are output using an inkjet printer [1]

5 Desktop publishing software keeping a record of phone numbers

- Measuring program matching illnesses to symptoms
- Presentation software producing a multimedia slideshow
- Inference engine monitoring the weather
- Database producing a magazine [5]
6

| Instructions must be typed to get a computer to carry out an action | ✓ |
| Icons represent programs | ✓ |
| It is more important that users understand how a computer works | ✓ |
| Menus are offered to help choose an action | ✓ | [4]

7 Four matched pairs from:

<table>
<thead>
<tr>
<th>INSTRUCTION</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORWARD $n$</td>
<td>Move $n$ forward</td>
</tr>
<tr>
<td>BACKWARD $n$</td>
<td>Move $n$ backward</td>
</tr>
<tr>
<td>LEFT $t$</td>
<td>Turn left $t$ degrees</td>
</tr>
<tr>
<td>RIGHT $t$</td>
<td>Turn right $t$ degrees</td>
</tr>
<tr>
<td>PENUP</td>
<td>Lift the pen</td>
</tr>
<tr>
<td>PENDOWN</td>
<td>Lower the pen</td>
</tr>
</tbody>
</table>

1 for instruction
1 for meaning | [8]

8 (a)

<table>
<thead>
<tr>
<th>Physical Variable</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>✓</td>
</tr>
<tr>
<td>Temperature</td>
<td>✓</td>
</tr>
<tr>
<td>Pressure</td>
<td></td>
</tr>
<tr>
<td>Wind speed</td>
<td></td>
</tr>
</tbody>
</table>
| Light | ✓ | [3]

(b) Measurement is the monitoring of physical variables without the microprocessor taking action
Control is when the microprocessor takes action depending on sensor readings | [1]
(c) Four from:

- Computer (readings) are more accurate than students
- Students might forget to take readings/readings can be taken at regular intervals
- Computer takes more reliable readings
- Readings can be taken/control can be carried out more frequently
- Readings can be taken/control can be carried out any time of day or night
- Computers can respond to changes immediately/quicker than students
- Students might be unavailable to take readings during school holidays/computers can work continuously/without taking a break [4]

9 (a) C5 [1]

(b) Any cell from e2:e6 [1]

(c) 6 [1]

(d) =b2-c2 [1]

(e) Two from:

Highlight D2 and click copy
Highlight D3:D6 and click paste
OR
Highlight D2 and manoeuvre to bottom right hand corner of D2
Using fill handle/little black square/cross drag down to D6
OR
Highlight D2:D6
Click on fill then down [2]

(f) Two from:

- Simulations
- Mathematical models
- Scientific models
- Civil engineering models [2]

(g) The real thing may need to large a timescale

| The real thing may need to large a timescale | ✓ |
| Computer models waste a lot of raw materials |
| The real thing is quicker to build |
| If a computer model fails it doesn’t need rebuilding | ✓ |
| Once a computer model is built it doesn’t cost a lot to run | ✓ |
| A model doesn’t cost anything to make | [3] |

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10 (a) Two from:

- Only one printer is needed
- Only one scanner is needed
- Data can be shared between computers/data can be accessed by one computer from another more easily
- Software can be shared/updated more easily
- All computers can access the internet through one connection [2]

(b) Router/modem [1]

(c) Advantages – two from:
- Can communicate with other companies by email
- Can use the internet to place orders
- Can use the internet to buy materials
- Can hold video conferences
- Can create own website to publicise company

Disadvantages – two from:
- Workers may access undesirable sites
- Workers may waste time playing games-going on social network sites/updating their blog/online shopping/banking
- Viruses/malware could be downloaded
- Could make the company susceptible to hackers [4]

11 (a) Three from:

- Authentication techniques such as user names and passwords identify the user to the system
- Without authentication anybody would be able to access data
- Hackers would be able to amend/delete data without being prevented
- Would have to rely on other methods such as firewalls to prevent unauthorised access. [3]

(b) Three from:

- Causes data to be scrambled/encoded
- Requires an encryption key/software to encrypt
- Requires a decryption key/encryption software to decrypt
- Results in data which is not understandable/readable
- Protects sensitive data...
- … from being understood if it falls in to the wrong hands [3]
12 Spyware
Two from:
Software that gathers data from computers without the user realising
It monitors and records all key presses
It sends this information back to the hacker who sent it out

Spam
Two from:
Electronic junk mail/sending of unsolicited emails
Sent to everybody on a mailing list/many emails sent at once
Can slow down networks
Can fill up the receiver’s mail box and therefore hard disk

Social networking site
Two from:
Online communities of like minded users
Enables users to share photos
Enables users to communicate with each other
Enables users to organise meetings
Allows users to set up profiles

13 (a)

<table>
<thead>
<tr>
<th>Field name</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race_ID</td>
<td>Text</td>
</tr>
<tr>
<td>Race_length</td>
<td>integer</td>
</tr>
<tr>
<td>Name</td>
<td>Text</td>
</tr>
<tr>
<td>position</td>
<td>integer</td>
</tr>
</tbody>
</table>

(b) Format/Picture
Checks the data is of the format beginning with a letter and ending in three digits and is only four characters long.

(c) Five from:

- Appropriate spacing for each field
- Buttons to go forward/backwards
- Screen filled/not too much white space
- Drop down lists to choose an option (such as race length)
- Button to save data/submit/accept
- Clearly defined input area for each field
- Tick boxes/radio buttons to enter choices
- An easy to read font/font size
- A sensible font colour/background colour
- Easy to follow instructions for completing screen/help icon
- No overlapping of items
14 (a) **Two** from:

Smart phone
Laptop with internet access
Tablet computer

(b) **Six** from:

Advantages:
- Fewer bank tellers so less paid out in wages
- Less actual cash handled – fewer robberies
- Have access to a wider customer base
- Fewer branch offices needed – less spent on rates/rent/utilities
- Less money spent on security staff

Disadvantages
- Initial cost of hardware/software is expensive
- Need to retrain staff
- Loss of customers/more difficult to sell other services due to lack of personal touch
- Costs of system maintenance

Must have at least one of each to gain full marks

15 **Four** from:

- No embarrassment of not having sufficient funds
- Less time spent queuing
- Can get money any time of day or night
- Own bank may be further to travel to than nearest ATM
- Can use most ATMs/does not have to be own bank
- Have choice of languages so is easier to understand/be understood

16 **Four** from:

- You get immediate feedback
- You know you have the right person/don’t have to worry that you’ve got the wrong email address
- You can ask questions immediately based on feedback/carry out an interactive conversation
- Less impersonal/less risk of upsetting recipient
- Can make yourself understood more easily
- You can see the other person’s reaction