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 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
1. A mainframe computer  [1]
   B laptop computer  [1]
   C personal digital assistant  [1]
   D desktop computer  [1]

2. buzzer  [1]
   DVD R  [1]
   joystick  [1]
   fixed hard disc  [1]
   plotter  [1]
   touch pad  [1]

3. True False

<table>
<thead>
<tr>
<th>Description</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database software is the best software to use to write letters.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>DTP software is used to create models.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Palmtop computers are bigger than PCs.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Graph plotters are used to output car designs.</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>A dot matrix printer is used to print magazines.</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

4. **Two** matched pairs from:

   - Range check
     Check no less than 0 and no more than 100

   - (Invalid) character check/Type check
     Must be digits only

   - Presence check
     Mark must be entered

5. | RAM | ROM |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>This memory can only be read from not written to</td>
<td>✓</td>
</tr>
<tr>
<td>This memory is not volatile</td>
<td>✓</td>
</tr>
<tr>
<td>This memory is used to store the data the user is currently working on</td>
<td>✓</td>
</tr>
<tr>
<td>This memory is used to store the startup instructions of a computer</td>
<td>✓</td>
</tr>
</tbody>
</table>
6 To input details from a bank card Joystick
   To input data from a school register Chip reader
   To input details of a product in a supermarket Optical mark reader
   To control an object in a computer game Bar code reader

7 Four matched pairs from:

<table>
<thead>
<tr>
<th>INSTRUCTION</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORWARD $n$</td>
<td>Move $n$ mm forward</td>
</tr>
<tr>
<td>BACKWARD $n$</td>
<td>Move $n$ mm 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 Two from:
  Optical Character Recognition/Reader
  Text is read by scanner
  Image compared with characters stored in computer
  Converted to text for use with other software

  Utility bills/word processors/ANPR/identity cards

9 (a) ✓

<table>
<thead>
<tr>
<th>Feature</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperlinks</td>
<td>✓</td>
</tr>
<tr>
<td>Colour</td>
<td></td>
</tr>
<tr>
<td>Large font size</td>
<td></td>
</tr>
<tr>
<td>Photos</td>
<td></td>
</tr>
<tr>
<td>Sound</td>
<td>✓</td>
</tr>
<tr>
<td>Video</td>
<td>✓</td>
</tr>
</tbody>
</table>
(b) Three from:

Saves school cost of printing copies
Can include colour at no extra cost
Can include animated text effects
Saves cost of delivery
Audience not limited to parents of school children

10 Four from:

Weblog
Usually one author
Personal opinions on a number of topics/personal thoughts
Can be an electronic diary
Others can comment
Only author can edit entries

11 Five from:

Data is read by sensors/downloaded from onboard computer/entered using keyboard/touch screen/answers to questions are typed in
Uses interactive interface/Asks questions...
.......based on previous responses
Expert system analyses data
Inference engine compares data
Compares data with that held in the knowledge base....... 
....... using rules base
Matches are found
System suggests possible faults/solutions

12 (a) Two from

Keypad to input required temperature
Sensor to input current temperature of the room

(b) Four from:

Microprocessor stores required temperature as preset value
Compares temperature from sensor to pre-set temperature
If temperature is lower than preset value microprocessor sends a signal to turn heater on
If higher than preset value microprocessor sends a signal (to the actuator) to turn heater off
If values are equal microprocessor does nothing
Wait set period of time before looping
13 (a)  

<table>
<thead>
<tr>
<th>Field name</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Text</td>
</tr>
<tr>
<td>Gender</td>
<td>Boolean</td>
</tr>
<tr>
<td>Species</td>
<td>Text</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>Numeric</td>
</tr>
<tr>
<td>Adoption cost</td>
<td>Currency</td>
</tr>
</tbody>
</table>

(b) Technical  

Two from:

Program listing  
Programming language  
Flowchart/algorithm  
List of variables  
File structure  
Purpose of the system/program  
Input format or example  
Output format or example  
Hardware requirements  
Software requirements  
Sample runs/test runs  
Known bugs/possible errors  
Validation rules  
Limitations of the system  

User  

Two from:

How to load software/install/run software  
How to save a file  
How to search  
How to sort  
How to print  
How to add records  
How to delete/edit records  
Purpose of the system/program (only if not mentioned in technical documentation)  
Input format or example (only if not mentioned in technical documentation)  
Output format or example (only if not mentioned in technical documentation)  
Hardware requirements (only if not mentioned in technical documentation)  
Software requirements (only if not mentioned in technical documentation)  
Sample runs (only if not mentioned in technical documentation)  
Error messages (only if not mentioned in technical documentation)  
Error handling  
Limitations of the system  
Tutorials  
Troubleshooting guide/Contact details/help line/FAQ  

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14 Two advantages from:

- Easy to carry/are portable
- Usually have mobile phone in your possession
- Can access Internet almost anywhere
- Can access Internet on the move

Two disadvantages from:

- Easily lost
- May have poorer signal
- Display is smaller/keyboard is smaller
- Content is more limited
- Can be slower to access Internet
- Batteries might run out
- No mouse so can be more difficult to navigate

15 (a) Three from:

Either
- It looks through (the cells) A2 to B9 in Sheet 1
- Compares with 'USA'/the contents of C3 (in Sheet 2)

Or
- It reads the contents of C3 (in Sheet 2)
- Compares with the contents of A2:B9 in Sheet 1

Until it finds the first matching value
- It records the corresponding value from column 2 of the range A2:B9 in Sheet 1
- C3 (in Sheet 2) contains USA
- Produces/records America

(b) Thailand

(c) Two from:

- It totals the contents
- Of cells D3 to F3

(d) Three from:

- It looks through the contents of D4 to F4...
- …to see if they are not equal to NT
- It counts the number of cells that are not
- Produces/records 2

(e) 3
(f) **Three** from:

Creating a model of a real system (such as a cockpit)…
...in order to study the behaviour of the system/pilot reactions
Is able to predict/react to the behaviour of the system or pilot
The cockpit simulation has all the controls normally found in an actual cockpit
Creating models of situations that pilots might meet in real life/Creatcs whatif scenarios [3]

16 (a) **Three** from:

Can act as a web server
Can act as a buffer (between Internet and LAN)
Server passes on requests to the Internet
Passes the requested web pages to individual computers
Can cache/store the webpages
Subsequent requests for that/those web page(s) are responded to more quickly
Can be used to monitor Internet usage
Can block certain sites [3]

(b) **Three** from:

Connects a LAN to a WAN
Connects a LAN to the Internet
Forward data packets to the individual computers on a network
Hold the addresses of each computer on the network [3]

17 (a) **Two** from:

Lawful protection....
......given to authors/software companies and publishers
Relates to the software the author/publisher/company created/published
Prohibits purchaser from making unlimited copies/lend it to others/change the software/sell it without the company’s permission [2]

(b) **Two** from:

Encryption of the execution code requires a key to run
Use of a dongle
Registration system requiring the typing in of a registration code
“Guards” are hardware or software modules that monitor the running program and ensure that it has not been tampered with in any way
Activation code which can be used only on a limited number of machines [2]
18 Seven from:

Car production is more consistent/robots produce the same standard every time
Cost – once bought they do not have to be paid/fewer employees so lower costs/don’t have to pay robots wages/lower running costs
No industrial disputes
Greater productivity
Greater accuracy/robots are more accurate
Can work in hazardous/extreme conditions/can lift heavier loads
Robots don’t take breaks/can work 24 hours a day 7 days a week/can work continuously
Robots have to be reprogrammed when there is a small change/can’t think for themselves
Robots need programming in order to be adaptable
Expensive start up costs – redundancy payments
Expensive start up costs – have to spend money on training workers to use robots
Expensive start up costs – buying of robots/programming of robots
Computer crash would halt production
Maintenance/repair costs can be expensive