MARK SCHEME for the May/June 2011 question paper
for the guidance of teachers

0417 INFORMATION AND COMMUNICATION TECHNOLOGY
0417/12 Paper 1 (Written), maximum raw mark 100

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.

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<table>
<thead>
<tr>
<th>Ques. No.</th>
<th>Answer</th>
<th>Part mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A Multimedia projector</td>
<td>B Speakers</td>
</tr>
<tr>
<td>2</td>
<td>Buzzer</td>
<td>DVD RAM</td>
</tr>
<tr>
<td>3</td>
<td>Measuring software is used to write letters</td>
<td>True</td>
</tr>
<tr>
<td></td>
<td>DTP software is used to create magazines</td>
<td>True</td>
</tr>
<tr>
<td></td>
<td>PDAs cannot be used unless plugged in to an electricity socket</td>
<td>True</td>
</tr>
<tr>
<td></td>
<td>Database software is used to create slide shows</td>
<td>True</td>
</tr>
<tr>
<td></td>
<td>A working knowledge of HTML is helpful when creating web pages</td>
<td>True</td>
</tr>
<tr>
<td>4 (a)</td>
<td>A graphics tablet</td>
<td>is used to input a hand drawn image to the computer.</td>
</tr>
<tr>
<td>(b)</td>
<td>A pressure sensor</td>
<td>is used to input data to a microprocessor controlled weighing scale.</td>
</tr>
<tr>
<td>(c)</td>
<td>A Trackerball</td>
<td>is an input device used by people with limited motor skills.</td>
</tr>
<tr>
<td>(d)</td>
<td>A graph plotter</td>
<td>is an output device used to produce large hard copies of car designs.</td>
</tr>
<tr>
<td>(e)</td>
<td>A buzzer</td>
<td>is an output device used in microwave ovens.</td>
</tr>
<tr>
<td>5</td>
<td>Whatifs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Queries</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automatic recalculation</td>
<td>True</td>
</tr>
<tr>
<td></td>
<td>Internet browsing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Animation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data replication</td>
<td>True</td>
</tr>
</tbody>
</table>
### 6

**Three** instructions and **three** paired meanings 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>

### 7

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>A faxed message is more private</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>An emailed message arrives with the customer more quickly</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>A faxed document can be used for legal purposes</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>An email attachment can be edited electronically</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

### 8

**Four** from:
- Is an example of online processing
- Requires immediate response
- Involves the use of sensors/temperature sensors are used in central heating
- Physical variables/temperature is monitored continuously
- Requires the use of feedback
- The output affects the input
- Heater switched on increases temperature
- Temperature above preset level causes microprocessor to switch off heater/ temp below preset level causes microprocessor to switch heater on

### 9 (a)

**Four** 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

### (b)

**Two** from:
- medical diagnosis
- Prospecting
- Tax
- Careers
- Chess games
- Animal/plant classification/identification
| 10 (a) | One mark for check, One mark for description from:  
Range check  
Number must be no lower than zero/no higher than highest number/158  
(Invalid) character/type check  
Only digits can be entered – no other characters | 2 |
| --- | --- |
| (b) | Must be different to (a)  
One mark for check, One mark for description from:  
Boolean check  
Data must be true or false/N or Y  
(Invalid) character/type check  
Only alphabetic characters can be entered/no digits  
Length check  
Must be exactly one character | 2 |
| (c) | Must be different to (a) and (b)  
One mark for check, One mark for description from:  
Format check  
Data must be two digits followed by slash followed by two digits followed by slash followed by two digits  
(Invalid) character/type check  
Only digits or slashes can be entered/no alphabetic or punctuation marks other than slash  
Length check  
Must have the same number of characters/be no more and no less than 8 characters  
Range check  
Day must be <32/Month must be less than 13/year must be <100/All must be >0/Whole date must be < today | 2 |
| 11 | To input text from a printed document  
Bar code reader | 1 |
|  | To input data from a bank cheque  
Chip reader | 1 |
|  | To input data from a bank card  
MICR | 1 |
|  | To input data about a product at a POS  
OCR | 1 |
### Mark Scheme: Teachers’ version

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Mark(s)</th>
</tr>
</thead>
</table>
| **12** | Three matched pairs from:  
User ID and one of password/PIN/Memorable data  
Password has to be entered before access is gained/Password can be changed frequently to avoid hackers guessing them/Unsuccessful logins can throw you out of the system  
Magnetic stripe/smart card/electronic key/bar code system/ID card  
Prevents people without cards accessing system  
Biometric data  
Fingerprint/retina/iris/face/voice recognition used as input/Biometric data is difficult to replicate | 6 |
| **13 (a)** | Two from:  
RSI – wrists  
RSI – fingers  
Headaches  
Back problems/neck pain  
Sight problems/Eye strain/dry eyes | 2 |
| **13 (b)** | Two from:  
Electrocution  
Trailing cables  
Fire/overheating of computers | 2 |
| **14** | Six from:  
Three advantages from:  
Documents/equipment do not have to be carried around  
School can call meeting at short notice  
Do not have to pay for travelling  
Do not have to pay hotel expenses  
Do not have to pay for conference room facilities  
Travelling time is saved  
Might be dangerous to fly/travel  
Disabled people may find it difficult to travel  
Three disadvantages from:  
Takes time to train students  
Difficult to call international meetings because of time differences  
Initial cost of hardware  
Equipment can break down  
Strength of signal/bandwidth/lipsync can be a problem/connection can be lost/power cuts | 6 |
### Question 15

**Four** from:
- Back/previous record button/arrow/facility
- Forward/next record button/arrow/facility
- New record button/arrow/facility
- Submit/save button/facility
- First record button/facility
- Last record button/facility
- Exit button/return to homepage button/facility
- Move to top of page if long form
- Search facility

### Question 16 (a)

**Six** from:

**Parallel running/implementation**
- A Information is not lost/always a second copy/training can be gradual
- D Expensive to run two systems together/expense of paying two sets of workers

**Phased implementation**
- A Still have most of system if things go wrong/no expense of running two systems together/no expense of paying two sets of workers/if latest phase fails only need to go back to that point/training can be gradual
- D Lose some data if things go wrong/more expensive than direct as each phase has to be evaluated before moving to next phase.

**Direct implementation/changeover**
- A Benefits are immediately available/do not have expense of running two systems together/less likelihood of errors as system will have been fully tested/It is the quickest method of implementation
- D If things go wrong lose all data/old system is not available/training is more difficult to organise

**Pilot running**
- A Still have most of system if things go wrong/no expense of running two systems together/Can train staff in one area only/have to pay fewer workers than parallel
- D More expensive than direct changeover as more workers are needed/slower method than direct/takes time to implement for whole company

Only award marks for **two** methods.

### Question 16 (b)

**Three** from:

- Comparison of the solution with the original task requirements
- Identification of any limitations to the system
- Identification of any necessary improvements
- Analysing/collecting users’ responses to using the system
- Comparison of test results of new system with old system results
- Comparison of the performance of the new system with performance of the old.
17 **Four** from:
- Microprocessor controlled devices do much of housework
- Do not need to do many things manually
- Do not need to be in the house when food is cooking
- Do not need to be in the house when clothes are being washed
- Can leave their home to go shopping/work at any time of the day
- Greater social interaction/more family time
- More time to go out/more leisure time/more time to do other things/work
- Are able to do other leisure activities when convenient to them
- Can lead to unhealthy eating due to dependency on ready meals
- Can lead to laziness/lack of fitness
- Can encourage a healthy lifestyle because of smart fridges analyzing food constituents
- Microprocessor controlled burglar alarm provides a sense of security
- Do not have to leave home to get fit
- Manual household skills are lost

18 (a)

<table>
<thead>
<tr>
<th>Sensor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure sensor</td>
<td></td>
</tr>
<tr>
<td>Movement sensor</td>
<td></td>
</tr>
<tr>
<td>Light sensor</td>
<td>✓</td>
</tr>
<tr>
<td>Temperature sensor</td>
<td>✓</td>
</tr>
<tr>
<td>Moisture sensor</td>
<td>✓</td>
</tr>
<tr>
<td>Infra red sensor</td>
<td></td>
</tr>
</tbody>
</table>

18 (b) Computers work in digital
Sensors produce analogue data

18 (c) **Five** max. from:
- Temperature is compared with preset value
- If lower microprocessor switches on heater
- If lower microprocessor shuts windows
- If higher microprocessor switches heater off
- If higher microprocessor switches fan on
- If higher microprocessor opens windows
- Humidity is compared with preset value
- Moisture level is compared with preset value
- If lower microprocessor switches on sprinkler
- If higher microprocessor switches off sprinkler
- Light is compared with preset value
- If lower microprocessor switches on light bulb
- If higher microprocessor switches off light bulb
- If reading is at the preset value then no action is taken by microprocessor

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19 Two matched pairs from:

Phishing
Hackers send an e-mail asking for a customer’s details/appear to be from the bank/says that the bank needs the information/asks the customer for password, card or account number

Pharming
Redirects a genuine website’s traffic to hacker’s website

Spyware/key logging software
Soft ware which detects key presses on the keyboard when the user logs on to bank account

20 Two advantages from:

Usually have mobile phone in your possession
Easy to carry/are portable
Can access internet almost anywhere

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