

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

**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.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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Ques. No.	Answer	Part mark																		
1	<p><b>A</b> Multimedia projector                      <b>B</b> Speakers</p> <p><b>C</b> Motor    <b>D</b> Dot matrix printer</p>	1, 1 1, 1																		
2	<p><b>Buzzer</b>                                      <b>DVD RAM</b>                                      <b>Keyboard</b></p> <p><b>Mouse</b>                                      <b>Memory Stick</b>                                      <b>Sensor</b></p>	1 1																		
3	<table border="1"> <thead> <tr> <th></th> <th>True</th> <th>False</th> </tr> </thead> <tbody> <tr> <td>Measuring software is used to write letters</td> <td></td> <td>✓</td> </tr> <tr> <td>DTP software is used to create magazines</td> <td>✓</td> <td></td> </tr> <tr> <td>PDA's cannot be used unless plugged in to an electricity socket</td> <td></td> <td>✓</td> </tr> <tr> <td>Database software is used to create slide shows</td> <td></td> <td>✓</td> </tr> <tr> <td>A working knowledge of HTML is helpful when creating web pages</td> <td>✓</td> <td></td> </tr> </tbody> </table>		True	False	Measuring software is used to write letters		✓	DTP software is used to create magazines	✓		PDA's cannot be used unless plugged in to an electricity socket		✓	Database software is used to create slide shows		✓	A working knowledge of HTML is helpful when creating web pages	✓		1 1 1 1 1
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4 (a)	<b>A graphics tablet</b> is used to input a hand drawn image to the computer.	1																		
(b)	<b>A pressure sensor</b> is used to input data to a microprocessor controlled weighing scale.	1																		
(c)	<b>A Trackerball</b> is an input device used by people with limited motor skills.	1																		
(d)	<b>A graph plotter</b> is an output device used to produce large hard copies of car designs.	1																		
(e)	<b>A buzzer</b> is an output device used in microwave ovens.	1																		
5	<table border="1"> <tbody> <tr> <td>Whatifs</td> <td>✓</td> </tr> <tr> <td>Queries</td> <td></td> </tr> <tr> <td>Automatic recalculation</td> <td>✓</td> </tr> <tr> <td>Internet browsing</td> <td></td> </tr> <tr> <td>Animation</td> <td></td> </tr> <tr> <td>Data replication</td> <td>✓</td> </tr> </tbody> </table>	Whatifs	✓	Queries		Automatic recalculation	✓	Internet browsing		Animation		Data replication	✓	1 1 1						
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6	<p><b>Three</b> instructions and <b>three</b> paired meanings from:</p> <table border="1"> <thead> <tr> <th>INSTRUCTION</th> <th>MEANING</th> </tr> </thead> <tbody> <tr> <td>FORWARD <i>n</i></td> <td>Move <i>n</i> mm forward</td> </tr> <tr> <td>BACKWARD <i>n</i></td> <td>Move <i>n</i> mm backward</td> </tr> <tr> <td>LEFT <i>t</i></td> <td>Turn left <i>t</i> degrees</td> </tr> <tr> <td>RIGHT <i>t</i></td> <td>Turn right <i>t</i> 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>	INSTRUCTION	MEANING	FORWARD <i>n</i>	Move <i>n</i> mm forward	BACKWARD <i>n</i>	Move <i>n</i> mm backward	LEFT <i>t</i>	Turn left <i>t</i> degrees	RIGHT <i>t</i>	Turn right <i>t</i> degrees	PENUP	Lift the pen	PENDOWN	Lower the pen	6	
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8	<p><b>Four</b> from:</p> <ul style="list-style-type: none"> <li>Is an example of online processing</li> <li>Requires immediate response</li> <li>Involves the use of sensors/temperature sensors are used in central heating</li> <li>Physical variables/temperature is monitored continuously</li> <li>Requires the use of feedback</li> <li>The output affects the input</li> <li>Heater switched on increases temperature</li> <li>Temperature above preset level causes microprocessor to switch off heater/ temp below preset level causes microprocessor to switch heater on</li> </ul>	4															
9 (a)	<p><b>Four</b> from:</p> <ul style="list-style-type: none"> <li>Data is read by sensors/downloaded from onboard computer/entered using keyboard/touch screen/answers to questions are typed in</li> <li>Uses interactive interface/Asks questions... ... based on previous responses</li> <li>Expert system analyses data</li> <li>Inference engine compares data</li> <li>Compares data with that held in the knowledge base... ... using rules base</li> <li>Matches are found</li> <li>System suggests possible faults/solutions</li> </ul>	4															
(b)	<p><b>Two</b> from:</p> <ul style="list-style-type: none"> <li>medical diagnosis</li> <li>Prospecting</li> <li>Tax</li> <li>Careers</li> <li>Chess games</li> <li>Animal/plant classification/identification</li> </ul>	2															

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
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10 (a)	<p>One mark for check, One mark for description from:</p> <p>Range check Number must be no lower than zero/no higher than highest number/158</p> <p>(Invalid) character/type check Only digits can be entered – no other characters</p>	2
(b)	<p>Must be different to (a) One mark for check, One mark for description from:</p> <p>Boolean check Data must be true or false/N or Y</p> <p>(Invalid) character/type check Only alphabetic characters can be entered/no digits</p> <p>Length check Must be exactly one character</p>	2
(c)	<p>Must be different to (a) and (b) One mark for check, One mark for description from:</p> <p>Format check Data must be two digits followed by slash followed by two digits followed by slash followed by two digits</p> <p>(Invalid) character/type check Only digits or slashes can be entered/no alphabetic or punctuation marks other than slash</p> <p>Length check Must have the same number of characters/be no more and no less than 8 characters</p> <p>Range check Day must be &lt;32/Month must be less than 13/year must be &lt;100/All must be &gt;0/Whole date must be &lt; today</p>	2
11	<p>To input text from a printed document</p> <p>To input data from a bank cheque</p> <p>To input data from a bank card</p> <p>To input data about a product at a POS</p> <p>Bar code reader</p> <p>Chip reader</p> <p>MICR</p> <p>OCR</p>	1 1 1 1

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

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15	<p><b>Four</b> from:</p> <p>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</p>	4
16 (a)	<p><b>Six</b> from:</p> <p><b>Parallel running/implementation</b></p> <p>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</p> <p><b>Phased implementation</b></p> <p>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.</p> <p><b>Direct implementation/changeover</b></p> <p>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</p> <p><b>Pilot running</b></p> <p>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</p> <p>Only award marks for <b>two</b> methods</p>	6
(b)	<p><b>Three</b> from:</p> <p>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.</p>	3

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17	<p><b>Four</b> from:</p> <p>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</p>	4																		
18 (a)	<table border="1"> <tr> <td>Pressure sensor</td> <td></td> <td></td> </tr> <tr> <td>Movement sensor</td> <td></td> <td></td> </tr> <tr> <td>Light sensor</td> <td>✓</td> <td>1</td> </tr> <tr> <td>Temperature sensor</td> <td>✓</td> <td>1</td> </tr> <tr> <td>Moisture sensor</td> <td>✓</td> <td>1</td> </tr> <tr> <td>Infra red sensor</td> <td></td> <td></td> </tr> </table>	Pressure sensor			Movement sensor			Light sensor	✓	1	Temperature sensor	✓	1	Moisture sensor	✓	1	Infra red sensor			
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(b)	<p>Computers work in digital  Sensors produce analogue data</p>	1 1																		
(c)	<p><b>Five</b> max. from:</p> <p>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</p> <p>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</p> <p>Light is compared with preset value  If lower microprocessor switches on light bulb  If higher microprocessor switches off light bulb</p> <p>If reading is at the preset value then no action is taken by microprocessor</p>	5																		

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19	<p><b>Two</b> matched pairs from:</p> <p>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</p> <p>Pharming Redirects a genuine website's traffic to hacker's website</p> <p>Spyware/key logging software Soft ware which detects key presses on the keyboard when the user logs on to bank account</p>	4
20	<p><b>Two advantages</b> from: Usually have mobile phone in your possession Easy to carry/are portable Can access internet almost anywhere</p> <p><b>Two disadvantages</b> 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</p>	4