

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

**0417 INFORMATION AND COMMUNICATION
TECHNOLOGY**

0417/11

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 | A Trackerball C Light pen B Digital camera D Joystick | 1, 1 1, 1 | | | | | | | | | | | | | | | | | | | | | |
| 2 | <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> buzzer magnetic tape </div> <div style="text-align: center;"> DVD RAM plotter </div> <div style="text-align: center;"> joystick touch pad </div> </div> | 1 1 | | | | | | | | | | | | | | | | | | | | | |
| 3 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">True</th> <th style="text-align: center;">False</th> </tr> </thead> <tbody> <tr> <td>A number pad is used to enter a PIN</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Presentation software is used to write letters</td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Database software is used to create queries</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>A Graphical User Interface uses icons to represent applications</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Sensors are used to store data</td> <td></td> <td style="text-align: center;">✓</td> </tr> </tbody> </table> | | True | False | A number pad is used to enter a PIN | ✓ | | Presentation software is used to write letters | | ✓ | Database software is used to create queries | ✓ | | A Graphical User Interface uses icons to represent applications | ✓ | | Sensors are used to store data | | ✓ | 1 1 1 1 1 | | | |
| | True | False | | | | | | | | | | | | | | | | | | | | | |
| A number pad is used to enter a PIN | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Presentation software is used to write letters | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| Database software is used to create queries | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| A Graphical User Interface uses icons to represent applications | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Sensors are used to store data | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| 4 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Validation</th> <th style="text-align: center;">Verification</th> </tr> </thead> <tbody> <tr> <td>A computer comparing two versions of the data</td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Using check digits</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Applying a length check</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Performing a range check</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Typing in data twice</td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Visually comparing data on screen with the original data source</td> <td></td> <td style="text-align: center;">✓</td> </tr> </tbody> </table> | | Validation | Verification | A computer comparing two versions of the data | | ✓ | Using check digits | ✓ | | Applying a length check | ✓ | | Performing a range check | ✓ | | Typing in data twice | | ✓ | Visually comparing data on screen with the original data source | | ✓ | 1 1 1 1 1 1 |
| | Validation | Verification | | | | | | | | | | | | | | | | | | | | | |
| A computer comparing two versions of the data | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| Using check digits | ✓ | | | | | | | | | | | | | | | | | | | | | | |
| Applying a length check | ✓ | | | | | | | | | | | | | | | | | | | | | | |
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| Typing in data twice | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| Visually comparing data on screen with the original data source | | ✓ | | | | | | | | | | | | | | | | | | | | | |
| 5 (a) | Two from: Switch Network card Hub | 2 | | | | | | | | | | | | | | | | | | | | | |
| (b) | One from: Router Modem | 1 | | | | | | | | | | | | | | | | | | | | | |
| 6 | A file is a collection of records/all the students names, addresses, phone numbers and dates of birth A field is one item of information/name/address/phone number/date of birth A record is all the information about one student/name, address, phone number and date of birth of one student | 1 1 1 | | | | | | | | | | | | | | | | | | | | | |

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|------------|---|---|
| 7 | <p>RIGHT 90 REPEAT 8 FORWARD 100 LEFT 45 END REPEAT</p> <p>1 mark for each correct statement</p> | 5 |
| 8 | <p>Four from: Cheques are collected together During the course of the day Cheques are then processed all at once Cheques are processed overnight Bank accounts updated following morning No human intervention</p> | 4 |
| 9 (a) | <p>Three from: Workers can use own office so documents do not get lost in transit/bulky documents/equipment do not have to be carried around Company can call meeting at short notice Employees can work from home Company does not have to pay travelling expenses Company does not have to pay hotel expenses Company does 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</p> | 3 |
| (b) | <p>Three from: Takes time to train employees 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 Loss of personal/social contact Takes time for workers to learn new technology Can't sign documents</p> | 3 |
| 10 (a) (i) | Air conditioning (Y/N) | 1 |
| (ii) | <p>One from The field only contains Y or N (two possibilities) It saves time entering data It reduces errors when inputting data It's easier to validate It saves storage space for the file</p> | 1 |
| (b) (i) | Number sold | 1 |
| (ii) | <p>One from: Might need to calculate total of all cars sold Easier to validate Might need to produce a graph Can easily find best selling make</p> | 1 |

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| 11 | <p>Four from:</p> <p>ROM cannot be changed/RAM can be changed RAM can be read from and written to ROM is read only memory and RAM is random access memory ROM holds instructions that need to be unchanged such as BIOS/program cycles in a washing machine/program instructions in games RAM holds the work that is being currently done by the user ROM is non-volatile/RAM is volatile</p> | 4 |
| 12 | <p>Four from:</p> <p>Symptoms are entered Uses interactive interface/Asks questions... ... based on previous responses Expert system analyses data Inference engine compares symptoms Compares with those held in knowledge base... ... uses rules base Matches are found Suggests probabilities/possible diagnoses</p> | 4 |
| 13 | <p>Two devices from:</p> <p>CD DVD Blu-ray DVD RAM</p> <p>One advantage from: More portable/less likely to spike/cheaper to buy</p> <p>One disadvantage: Limited capacity/slower access times/slower transfer rates/can be more easily lost/can be more easily stolen/can be more easily scratched</p> | 2 1 1 |
| 14 | <p>LAN uses cables to transmit data WLAN uses wireless technology</p> <p>Advantage Cheaper as less cabling/new workstations can be sited anywhere/different devices can be connected easily</p> <p>Disadvantage Slower transfer rates/limited transmission distance/physical obstacles can limit transmission/less security</p> | 1 1 1 1 |

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| 15 | <p>Two problems from: Headaches (from staring at screen continuously) Eyestrain (from staring at screen continuously) RSI in fingers (from continual typing/repetitive clicking of mouse) RSI in wrists (from continual typing/repetitive clicking of mouse) Backache from sitting in same position all day</p> <p>Two matching methods from: Use anti-glare screen (headaches/eyestrain) Take regular breaks (all) Use ergonomic keyboard (RSI) Use wrist rests (RSI) Use straight backed chair/maintain good posture (backache)</p> | 4 |
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| 16 | <p>Three matched triples from:</p> <p>Authentication technique/User ID and Passwords/PIN/memorable data Advantage Only person who knows password can access data Disadvantage Key logging software can detect key presses/passwords can be intercepted by expert hackers/user can forget password</p> <p>Encryption Advantage Data is scrambled into unreadable form/only person/computer with key can understand data Disadvantage Data can still be deleted from system</p> <p>Firewall Advantage Only allowed users/computers can access data Disadvantage It is not necessarily the hacker that is excluded but the computer/hackers might use an acceptable computer</p> <p>Digital certificates Advantage Only computer with certificate can access data Disadvantage Can be expensive to purchase</p> <p>Anti Spyware Advantage Prevents spyware from invading your computer and gaining personal information Disadvantage Doesn't work for all invasions/needs to be continually updated</p> <p>TANs Advantage Is a double layer of security Disadvantage PIN can be forgotten/if misused can generate wrong TAN</p> <p>Award one mark for name and one for an advantage and one for a disadvantage up to a maximum of three marks for each triple answer</p> | 9 |
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| 17 (a) | <p>Three descriptions from: Observing the librarian/students/teachers using the current system Questionnaires are distributed to librarian/students/teachers asking questions about the current system Interviewing the librarian/students/teachers asking questions about the current system Examining documents from the current system</p> | 3 |
| (b) | <p>Appropriate spacing for each field Forward and backward buttons</p> <p>Title Author's name Reference number/ISBN/Publisher/Picture of cover/Dewey number/Genre or category/fiction or non-fiction/target age group/picture of author/date published/summary of contents/no. of copies/cost price/selling price/number of pages/hardback or softback</p> <p>Information fills the page AND is clearly a screen form</p> <p>Maximum of five marks</p> | <p>1 1</p> <p>1 1</p> <p>2 marks for 4 items, 1 for 3 items else 0</p> <p>1</p> |
| 17c | <p>Three from: Keyboard to type in data A bar code (reader) A magnetic stripe (reader) Touch screen Biometric methods RFID</p> | 3 |
| 18 (a) | <p>Normal data Data is between 0 and 100/within the given range</p> | 1 1 |
| (b) | <p>Extreme data Data is on the boundary of given range</p> | 1 1 |
| (c) | <p>Abnormal data Data is outside the given range</p> | 1 1 |

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| 19 | <p>Technical</p> <p>Two from:</p> <p>Program listing</p> <p>Programming language</p> <p>Flowchart/algorithm</p> <p>List of variables</p> <p>File structure</p> <p>Purpose of the system/program</p> <p>Input format or example</p> <p>Output format or example</p> <p>Hardware requirements</p> <p>Software requirements</p> <p>Sample runs/test runs</p> <p>Known bugs/possible errors</p> <p>Validation rules</p> <p>2</p> <p>User</p> <p>Two from:</p> <p>How to load software/install/run software</p> <p>How to save a file</p> <p>How to search</p> <p>How to sort</p> <p>How to print</p> <p>How to add records</p> <p>How to delete/edit records</p> <p>Purpose of the system/program (only if not mentioned in technical documentation)</p> <p>Input format or example (only if not mentioned in technical documentation)</p> <p>Output format or example (only if not mentioned in technical documentation)</p> <p>Hardware requirements (only if not mentioned in technical documentation)</p> <p>Software requirements (only if not mentioned in technical documentation)</p> <p>Sample runs (only if not mentioned in technical documentation)</p> <p>Error messages</p> <p>Error handling</p> <p>Tutorials</p> <p>Troubleshooting guide/Contact details/help line/FAQ</p> <p>1</p> <p>2</p> | 1 |
| 20 | <p>Six from:</p> <p>Does site have excessive advertising</p> <p>Is the advertising related only to its own products</p> <p>Can use the final part of a URL to identify reliability</p> <p>.ac, .gov, .org are usually fairly reliable</p> <p>Can compare information from reliable sites to see if it is reliable</p> <p>Can compare with information from reliable/authenticated/text books</p> <p>Is site endorsed</p> <p>Does it have links to other reliable sites/unreliable sites</p> <p>Does it have testimonials</p> <p>See if responsible bodies have endorsed the site</p> <p>Check the date of the last update</p> <p>Are there links to and from the website to and from well known reliable websites?</p> <p>Checking the author's credentials</p> | 6 |