

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

**MARK SCHEME for the May/June 2009 question paper**  
**for the guidance of teachers**

**0417 INFORMATION AND COMMUNICATION  
TECHNOLOGY**

**0417/01**

Paper 1 (Written), maximum raw mark 120

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.

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- 1    **A** Magnetic stripe (1)  
       **B** Magnetic ink characters (1)  
       **C** Chip (1)  
       **D** Optical marks (1)  
       **E** Bar code (1) [5]
- 2    Graphics tablet (1)  
       Touch screen (1) [2]
- 3    F (1)  
       F (1)  
       T (1)  
       T (1)  
       F (1) [5]
- 4    Desk top publishing → producing a school magazine (1)  
       Measuring program → monitoring temperature in a science experiment (1)  
       Spreadsheet → managing personal finance (1)  
       Inference engine → suggesting medical diagnoses (1)  
       Database → storing pupil records in a school (1) [5]
- 5    **(a)** Numeric (Integer) (1)
- (b)** Alphanumeric (1)
- (c)** Boolean (1)
- (d)** Date (1) [4]
- 6    Forward            80  
       Right             90  
       Forward            180  
       Right             90  
       Forward            70  
       Penup  
       Forward            10  
       Pendown  
       Right               90  
       Forward            80  
       (Left               90)
- Pendown and Right 90 are interchangeable
- 1 mark for each pair of statements [5]

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- 7 (a) Hybrid/tree (1) [1]
- (b) Star (1)  
Bus (1) [2]
- (c) (i) A hub (1)  
(ii) A switch (1)  
(iii) A proxy server (1)  
(iv) A bridge (1) [4]
- 8 F (1)  
T (1)  
T (1)  
F (1) [4]
- 9 Real Time (1)  
Batch (1)  
Real Time (1)  
Batch (1) [4]
- 10 (a) 1 [1]
- (b) A4 [1]
- (c) Any cell in the range B2 to F5 [1]
- (d) (=) D2\*E2 [1]
- (e) Fill down (1)  
Copy and paste (1)  
Dragging the fill handle down (1) [3]

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- 11 (a)** Questionnaires (1)  
Interviews (1)  
Examination of documents (1)  
Observation (1) [4]
- (b)** To detect typing errors/data entry errors/transcription errors [1]
- (c) Either:**  
Visual verification (1)  
Typed in data is visually compared with original data (1)  
**Or**  
Double entry (1)  
Date is typed in twice and computer compares the two versions (1) [2 max]
- (d) Four from:**  
Name  
Title/gender  
Customer number/id  
Address  
Post code  
(Work/Mobile) phone number  
(Home/Mobile) phone number  
Email address  
Car registration number(s) [4]
- (e) Four from:**  
Button to close form  
Button to first record/form  
Button to end of file/new record  
Button to previous record/form  
Button to next record/form  
Submit/continue button  
Space to enter required record number  
Search facility/engine  
Button to go to sub forms [4]
- (f)** Field names (1)  
Validation routines (1)  
Field Lengths (1) [3]
- (g) Three from:**  
Parallel running  
Pilot running  
Phased implementation  
Direct changeover [3]
- (h)** The appropriateness of the solution (1)  
Comparing the solution with the original task requirements (1)  
Any improvements which can be made to the system (1) [3]

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- 12 (a) Two from:**  
Flight/pilot simulation/training  
Large scale chemical experiments  
Design of fairground rides  
Design of large buildings/bridges  
Traffic control  
Building fire simulation  
Car driving simulation  
Drug trials [2]
- (b) Three from:**  
Real thing may be too expensive to build  
Real thing requires too large a time scale  
Real thing would be too wasteful of materials  
Real thing is too vast a scale  
Real thing may occur too rarely  
Rate of change can be adjusted for human eye to detect  
Corrections can be made if mistakes in real thing/amendments are easier in a model [3]
- 13 Inference engine (1)**  
Interactive input screen (1)  
Knowledge base (1)  
Rules base (1) [4]
- 14 (a) RSI (1)**  
Headaches (1) [2]
- (b) Take regular breaks (1)**  
Put a screen filter in front of the monitor (1) [2]
- (c) Electrocutation (1)**  
Fire (1) [2]
- (d) Don't overload electrical sockets (1)**  
Make sure there are no bare wires (1) [2]
- 15 Three from:**  
Keyboard/typing in data  
A bar code (reader)  
A magnetic stripe (reader)  
Touch screen
- Three from:**  
Scanning bar codes/swiping magnetic stripes/touch screen gives fast data entry/keying in data can be slow  
Scanning bar codes/swiping magnetic stripes/touch screen reduces errors/keying in data can lead to data errors  
Keyboards/touch screens are robust/bar codes can be flimsy  
Magnetic stripes are more robust than bar codes [6]

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**16 (a) Three from:**

- Reduced cost of wage bill
- Computer readings are more accurate/human errors are reduced
- Readings can be taken more frequently/continuously
- Nurses can get tired and forget to take readings
- Nurses are so busy they might not be able to take readings regularly
- Nurses won't be exposed to contagious diseases
- Automatic warnings can be generated
- Graphs can be produced automatically
- Nurses can be freed up to do other tasks

[3]

**(b) Four from:**

- Sensors are used (to generate data)
- Data are then sent to computer
- Sensors read analogue data
- Computers work with digital data only
- Data needs to be converted so computers can process/understand data

[4]

**17 Six from:**

**Advantages**

- 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

**Disadvantages**

- 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

Max. 4 advantages/disadvantages

One mark available for reasoned conclusion

[6]

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**18 Four from:**

- Data more difficult to copy
- Extra layer of security with PIN number
- Even if stolen card cannot be used unless thief knows PIN number
- Larger amount of information can be stored
- Disabled people find it easier than signing
- Reduces disputes at checkouts over validity of signature/
- Saves time at checkouts
- Not affected by magnetic fields

[4]

**19 Eight from:**

**Fax**

**Advantages**

- Can be used as a legal document
- Documents can be very long

**Disadvantages**

- Cannot be certain if correct person has received it
- Very slow transmission rates
- Not very good quality
- Documents cannot be edited easily
- Cannot send multimedia files
- Won't be received if line is busy/receiving fax machine switched off/out of paper
- Wastes/expense of ink/paper

**Email**

**Advantages**

- Can be confident message will only go to the correct person (if addressed correctly)
- Fast transmission times
- Attachments can be downloaded and edited
- Easier to send large documents

**Disadvantages**

- Can be slow turnaround times
- Some systems have limits to size of attachments
- Addresses more difficult to remember than phone numbers
- Description of how phishing can occur
- Description of how viruses can be transmitted

**Bulletin boards**

**Advantages**

- You don't need an ISP
- Messages can be moderated
- Automatically creates an archive

**Disadvantages**

- Lack of privacy (every member of the group can see every message)
- In older systems only one person can be online at one time
- Doesn't alert you to incoming messages
- One mark available for reasoned conclusion

[8]