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)
    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

    Pendown and Right 90 are interchangeable

    Right  90
    Forward  80
    (Left  90)

    1 mark for each pair of statements [5]
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]
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]
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

(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

13
- Inference engine (1)
- Interactive input screen (1)
- Knowledge base (1)
- Rules base (1)

14 (a) RSI (1)
- Headaches (1)

(b) Take regular breaks (1)
- Put a screen filter in front of the monitor (1)

(c) Electrocution (1)
- Fire (1)

(d) Don’t overload electrical sockets (1)
- Make sure there are no bare wires (1)

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
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/bandwith/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]
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

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